

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—26TH YEAR.

SYDNEY, SATURDAY, OCTOBER 28, 1939.

No. 18.

Table of Contents.

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES—	Page.	OBITUARY—	Page.
The Effect of Oestrogenic Hormone on the Prostate of the Marsupial <i>Trichosurus Vulpecula</i> , by ARTHUR CARRODUS and ADOLPH BOLLIGER ..	633	Sinclair Gillies ..	665
The Infant Welfare Movement in Australia, by W. G. ARMSTRONG, M.B., Ch.M., D.P.H. ..	641	Wendell Inglis Clark ..	667
Sigmund Freud (1856-1939), by W. S. DAWSON, M.D. ..	648	Frederick John Gawne ..	668
		Louis Bernard Diamond ..	668
REVIEWS—		MEDICAL PRACTICE—	
Rheumatism in General Practice ..	652	The Medical Eye Service of New South Wales ..	668
Physics for Medical Students ..	652	POST-GRADUATE WORK—	
NOTES ON BOOKS, CURRENT JOURNALS AND NEW APPLIANCES—		Week-End Course at Brisbane ..	668
An Atlas of Anatomy ..	652	CORRESPONDENCE—	
LEADING ARTICLES—		M.D. Degrees in Australia ..	668
Rheumatism in Children ..	653	Treatment of Wounds of the Hand ..	668
CURRENT COMMENT—		Election of Standing Committee of Convocation, University of Sydney ..	669
Referred Pain ..	654	UNIVERSITY INTELLIGENCE—	
Aspirin as a Cause of Hæmatemesis ..	655	The University of Sydney ..	669
ABSTRACTS FROM CURRENT MEDICAL LITERATURE—		NAVAL, MILITARY AND AIR FORCE—	
Physiology ..	656	Medical Officers for the Australian Special Force ..	669
Biological Chemistry ..	657	THE ROYAL AUSTRALASIAN COLLEGE OF SURGEONS—	
SPECIAL ARTICLES ON CIVILIAN WAR CASUALTIES—		Meeting of the Board of Censors ..	669
War Wounds ..	658	PROCEEDINGS OF THE AUSTRALIAN MEDICAL BOARDS—	
BRITISH MEDICAL ASSOCIATION NEWS—		South Australia ..	669
Medico-Political ..	659	NOMINATIONS AND ELECTIONS ..	670
PUBLIC HEALTH—		BOOKS RECEIVED ..	670
Epidemic Encephalitis ..	665	DIARY FOR THE MONTH ..	670
		MEDICAL APPOINTMENTS ..	670
		MEDICAL APPOINTMENTS VACANT, ETC. ..	670
		MEDICAL APPOINTMENTS: IMPORTANT NOTICE ..	670
		EDITORIAL NOTICES ..	670

THE EFFECT OF OESTROGENIC HORMONE ON THE PROSTATE OF THE MARSUPIAL *TRICHOSURUS VULPECULA*.

By ARTHUR CARRODUS and ADOLPH BOLLIGER.

(From the Gordon Craig Urological Research Laboratory, Department of Surgery, University of Sydney.)

IN 1933 Lacassagne⁽¹⁾ injected mice with œstrin for periods of about five months in order to investigate the possible carcinogenetic action of this substance. At autopsy he found that the prostates of the males had increased in size, that the epithelium showed hyperplasia and metaplasia, and that retention of urine and hydronephrosis had occurred. These observations were confirmed by a number of workers. Burrows and Kennaway,⁽²⁾ and particularly Burrows,⁽³⁾ studied the sequence of events in the accessory reproductive organs of mice which had been injected or painted with oestrogenic

substances. The initial change observed was an arrest of secretion. A stage of hyperplasia then supervened, characterized by an increase in the layers of cells lining the secreting alveoli. Following this stage metaplasia occurred and the hyperplastic epithelium became replaced by squamous stratified epithelium which might show keratinization. He then observed a final stage, in which leucocytes invaded the keratinized epithelium and gave rise to suppuration.

Besides the mouse, other male mammals were investigated, such as the rhesus monkey,⁽⁴⁾ the Barbary macaque,⁽⁵⁾ the dog,⁽⁶⁾ the ground squirrel⁽⁷⁾ and the guinea-pig.⁽⁸⁾ It was found that the prostates of the last three species reacted in a similar manner to that of the mouse. The primates react somewhat differently, and Zuckerman⁽⁹⁾ took up the study of the influence of oestrogenic substances on monkeys on account of the near relationship between monkey and man. In contrast with

the findings in lower animals, the increase in the size of the prostate consisted mainly of growth of the utricular bed—the region intervening between the urethra and the glandular area. The epithelium of the urethra, *uterus masculinus*, the terminal parts of the ejaculatory ducts and of the collecting ducts of the prostate showed hyperplasia and metaplasia, whilst the epithelium of the true prostate gland remained unaffected.

So far no studies have been made of the response of Australian marsupials to sex hormones. Amongst other problems in connexion with this theme we studied the effect of oestrogenic material on a representative male marsupial, the common possum or *Trichosurus vulpecula*.

The Normal Prostatic Urethra or Prostate of
Trichosurus Vulpecula.
Previous Work.

In 1892 the accessory sex glands of marsupials were studied extensively by Oudemans.⁽¹⁰⁾ He did not examine the Phalangeridae, but confined his attention to other marsupials, such as Didelphyidae, Dasyuridae, Peramelidae and Macropodidae. He pointed out that none of these animals possessed a verumontanum; nor had they any seminal vesicles or any ampulla along the *vasa deferentia*. Further, he emphasized the fact that true prostatic glands were absent. However, in all the marsupials studied a thick cone-shaped glandular mass surrounds the urethra, which structure is frequently referred to as the "prostate" gland or the prostatic urethra. Oudemans considered this glandular mass to be urethral glands, which reach an enormous development in marsupials, not equalled by any other mammal. He also drew attention to the fact that the accessory sex glands develop late in marsupials.

A few years later Disselhorst⁽¹¹⁾ examined *Trichosurus vulpecula*, in which he found the same characteristics with regard to the accessory sex glands as Oudemans.

The next investigator in this field, Van den Broek,⁽¹²⁾ contradicts Disselhorst by stating that the Phalangerinae have a verumontanum, which, however, is not as well developed as in *Phascodomys*. In the case of the so-called prostate gland, Van den Broek made detailed examinations only in *Macropus*. He drew attention to the fact that the longitudinally cut surface of the prostatic urethra shows two distinct areas. At the cranial end, in the vicinity of the *colliculus seminalis*, he described an inverted cone-shaped area, which has a smooth, glistening surface. This portion of the gland he considered to be the true prostate. This is separated from the rest of the gland by a readily visible vascular zone. The lower part of the prostatic urethra has a striated appearance and apparently consists of urethral glands.

The microscopic appearance of the two areas is distinct. The large and irregular lumina of the urethral glands lie in close apposition, while the lumina of the acini of the true prostate gland are separated by bands of stroma. They are also smaller than the urethral glands. Their epithelium is

cylindrical and is about 16 μ high. The inner surface of the epithelial cells has a finely granulated boundary, while the rest of the cytoplasm is homogeneous. The lumina of these glands are usually filled with small round bodies and sometimes with remnants of nuclei.

The urethral glands are lined by a cuboidal epithelium which is 6 μ high. In other respects Van den Broek has nothing further to add to Oudemans's description of these glands.

Later, MacKenzie⁽¹³⁾ also examined the prostatic urethra of the marsupials. He added nothing new to the anatomical structure as described by previous workers, but pointed out that the *Trichosurus vulpecula* possesses the largest prostatic urethra of all the marsupials.

Recently, Fordham⁽¹⁴⁾ has studied the urogenital tract of the numbat (*Myrmecobius fasciatus*). According to her, this marsupial also possesses a prostatic urethra, which is essentially of the same structure as that described in the other marsupials by previous workers.

In view of the somewhat diverse views advanced in the literature, further studies of the normal urogenital tract of the possum were specially carried out.

Personal Observations.

As already pointed out by MacKenzie,⁽¹³⁾ *Trichosurus vulpecula* has a very large prostatic urethra. The relationship of the weight of the prostate to body weight is found to be about from 1 to 100 to 1 to 180, as shown in Table I. The prostate is the largest organ but one in the abdomen of this mammal.

TABLE I.
Body Weight, Weight of Both Kidneys, and Weight of the Prostate of Untreated Adult Possums.

Number.	Body Weight.	Prostate.	Kidneys.	Ratio Prostate Weight: Body Weight
	Kgs.	Gms.	Gms.	
1	2.4	17.8	14.2	1 : 135
2 ¹	1.5	15.0	11.4	1 : 100
3	3.1	25.1	15.8	1 : 124
4	2.5	13.6	11.0	1 : 183

¹ Animal very thin.

As described by previous workers, the prostate is conical in shape, somewhat resembling a carrot in outline, the broad base being at the bladder neck and the apex at the junction with the membranous urethra. There is a fairly definite demarcation between these two portions of the urethra, and near the junction the gland is angulated (Figure I). On examination of the external surface two areas can be seen. The upper one, which comprises about two-thirds of the gland, is white in colour, while the lower third is somewhat greyish.

A coronal section through the middle of the prostatic urethra shows the following structure (Figure II). The gland has an outer covering of involuntary muscle about two millimetres in thickness. The lumen of the urethra, which runs through

the middle of the gland, is very narrow at the base, immediately adjacent to the bladder. Here, for a distance of a few millimetres it is about one millimetre in diameter, then it widens out more or less abruptly to about four millimetres in width



FIGURE I.

Organs of normal possum (number 3), showing prostate, bladder, kidneys, rectum, cloacal glands and protruded tip of penis.

and slowly tapers down again to about two millimetres in width in the middle of the gland. Below this the prostatic urethra is of approximately the same calibre as the membranous urethra. The *vasa deferentia* enter laterally only a few millimetres below the bladder neck, forming a small *colliculus seminalis*.

On macroscopic examination the glandular tissue proper can be divided into three zones or areas: (A) The proximal zone, which is distinguished from the adjacent tissue by a glistening white surface. This zone has the shape of an inverted cone surrounding the narrow upper part of the urethra. This area probably corresponds to the prostatic area as described by Van den Broek in *Macropus*.⁽¹²⁾ (B) The central zone, which is of an opaque white appearance and which shows a markedly striated

surface. The striations run towards the urethra. This zone is the largest of the three. The areas adjacent to the urethra show a greyish discoloration. (C) The distal zone, which is demarcated from the central zone (B) by a change of colour towards grey and also shows marked striation. Viscous milky fluid can be expressed from the cut surface of the whole gland.

On microscopic examination of transverse sections of zone A the narrow urethra is found to be surrounded by a band of fibrous tissue, which extends towards the surface posteriorly. This fibrous area is surrounded by small round or hexagonal acini of about equal size. These are lined by columnar epithelium which stains well. The lumina of these acini frequently contain granular bodies. The amount of fibrous tissue between the acini varies, being relatively abundant near the central part of the area but in other places being practically absent.



FIGURE II.

Longitudinal section of bladder and prostate of untreated possum (number 2), showing the three zones A, B and C. Probes have been placed in the narrow lumen of the urethra immediately adjacent to the bladder and in the ureter.

Zones B and C differ from zone A and, as pointed out before, Van den Broek⁽¹⁰⁾ considered this area to consist of urethral glands. Zone B shows large elongated tubules with terminal acini which are lined by a low cubical or flattened

epithelium. There is little fibrous tissue between the acini, which are sometimes filled with a faintly staining colloid. On the whole, the epithelium in zone B appears to be in a less active state than zone C (see Figure IV).

Zone C also consists of long elongated acini, but there is more fibrous tissue between them than in zone B. The epithelium consists of poorly staining cubical cells of varying height, which are more eosinophilic than the epithelium present in the rest of the gland. The lumina of the acini contain secretion and disintegrating cells, suggesting a state of greater activity than that found in the preceding zone. The line of demarcation between zones B and C is distinct, there being an increase of fibrous tissue along the junction.

In concluding our remarks on the structure of the prostate of *Trichosurus vulpecula* we should like to emphasize the fact that marsupials do not possess a true prostate gland as found in higher mammals. This also applies to zone A, because the entire organ is enclosed by a layer of smooth muscle. Only if the muscle fibres are found between the tubules and acini does one speak of a prostate gland in the true anatomical sense. In the work described in the following section an attempt was made to ascertain the reaction of this rather peculiar urogenital apparatus of marsupials towards oestrogenic material, and extensive studies were made, mainly on the common possum (*Trichosurus vulpecula*).

Experimental Work.

Ten possums of varying ages were injected with different doses of oestrogenic substance in the form of a benzoate ester of the crystalline ovarian follicular hormones ("Estroform", British Drug Houses). These experiments are summarized in Tables II and III. All of the ten animals were injected intramuscularly once a week with an oily solution of "Estroform", as shown in Table II. The weekly injections were maintained until death, except in experiments 9 and 11, in which an injection-free interval was allowed. The youngest animals were five months (experiment 14), ten months (experiment 10) and ten months (experiment 13) of age. Two other animals were about one year of age (experiments 11 and 12). The rest of the laboratory animals were sexually mature but of varying unknown ages.

TABLE II.
Summary of Experiments with Possums.

Number.	Duration of Experiment, Days.	Dosage, International Units.	Weekly Injection, International Units.	Blood Urea at Death, Milligrammes per centum.	Gross Changes in Upper Urinary Tract.
5	13	150,000	50,000	372	Congenital absence of one kidney, otherwise nil.
6	17	120,000	45,000	133	Nil.
7	24	165,000	45,000	328	Nil.
8	30	120,000	20,000	253	Bilateral hydroureter and early hydronephrosis.
9	55	400,000	50,000	216	Bilateral hydroureter and early hydronephrosis.
10	60	135,000	15,000	92	Some dilatation of upper and lower thirds of ureters.
11	65	450,000	50,000	800	Nil.
12	112	170,000	10,000	104	Left hydroureter and early left hydronephrosis.
13	113	120,000	5,000	194	Bilateral hydroureter and hydronephrosis. In addition, vesical calculus.
14	122	12,800	700	400	Bilateral hydroureter and early hydronephrosis. In addition, vesical calculi and prostatic calculi.

TABLE III.
Summary of Experiments with Possums.

Number.	Body Weight.		Kidneys.	Prostate.	Ratio Prostate Weight: Body Weight (Initial).
	Initial.	Terminal.			
5	Kgs. 2.3	Kgs. 3.2	Gms. 13.7	Gms. 9.0	1:270
6	2.4	1.7	13.6	8.0	1:300
7	2.6	1.9	15.0	7.8	1:300
8	2.5	2.0	15.4	7.3	1:350
9	2.5	—	15.2	11.0	1:230
10	1.27	1.1	9.4	1.25	1:1,000
11	1.85	1.25	13.9	2.3	1:800
12	1.8	1.2	7.6	4.1	1:450
13	1.2	0.82	10.3	1.2	1:1,000
14	0.78	1.2	7.0	4.3	1:280 (Terminal).

Protocols of Typical Cases.

In addition to the information given in the tables protocols of typical cases will now be presented.

Possum 6.—Possum 6 was a mature, healthy, adult male. A urine specimen obtained preexperimentally contained spermatozoa.

On June 29, 1938, the animal received an intramuscular injection of 45,000 international benzoate units of oestrogenic substance ("Estroform", British Drug Houses).

On July 4, 1938, 30,000 units were injected.

On July 11, 1938, 45,000 units were injected. The animal appeared to be losing weight. A urine specimen was obtained which showed spermatozoa.

On July 13, 1938, the urine was found to contain albumin but no spermatozoa.

On July 16, 1938, the animal now was thin and in poor condition. Its movements were sluggish, but it was still eating well. It was anaesthetized with ether and a blood specimen was obtained by cardiac puncture. After this the animal was killed. The blood obtained prior to death contained 133 milligrammes per centum of urea.

Post Mortem Findings.—The body was thin and weighed 1.6 kilograms. The viscera appeared normal, with the exception of the genito-urinary tract. The kidneys were slightly enlarged and measured 3.1 by 1.9 by 1.4 centimetres each. The ureters appeared normal and the bladder wall was thickened. The prostatic urethra measured 3.9 by 2.4 by 2.0 centimetres and weighed 8.0 grammes. It seemed smaller than that seen in controls of similar size. As in the controls, two areas were seen from the external aspect and three areas on section, that is, zones A, B and C.

Microscopic Findings.—In zone A there were definite squamous metaplasia and gradual diminution of the lumen of the acini. There was also an increase in fibrous tissue. Zone B showed definite hyperplasia and some increase in interstitial fibrosis. In zone C squamous metaplasia was evident in the prostatic ducts near the urethra, while the acini showed marked hyperplasia. As in zone B, these changes were most marked near the urethra, but secretion was evident in the alveoli in zone C only.

Necrosis and cloudy swelling were found in many tubules of the kidneys, while in the intervening areas the tubules were dilated. In the medulla some patchy fibro-cellular change was observed, but the arteries appeared normal and most of the glomeruli also appeared normal, only a few showing cloudy swelling and necrosis.

Possum 7.—Possum 7 was a healthy adult male. Its body weight was 2.6 kilograms.

On July 18, 1938, the animal arrived at the laboratory and had spermatozoa in its urine. This was observed again on eight subsequent observations.

On August 11, 1938, an X ray picture was taken of the lower third of the animal. The shadow obtained indicated a prostate of normal size. On examination of the urine numerous spermatozoa were found. An intramuscular injection of 45,000 units of oestrin was given.

On August 16, 1938, 30,000 units of oestrin were injected intramuscularly.

On August 23, 1938, the animal appeared to be losing weight; 45,000 units of oestrone were given intramuscularly.

On August 30, 1938, 45,000 units of oestrin were injected intramuscularly. The animal now was definitely thin and in poor condition. There was oedema of the eyelids. The possum was still eating well, but its movements were sluggish and indicated loss of strength. This became progressively worse for the next five days.

On September 4, 1938, the animal could hardly walk. However, it was still eating and very thirsty. It was lightly anaesthetized with ether and blood was obtained by cardiac puncture. The animal was then killed. The blood obtained prior to death contained 326 milligrammes per centum of urea, 252 milligrammes per centum of non-protein nitrogen, and 3.0 milligrammes per centum of creatinine.

Post Mortem Findings.—The animal was very thin and weighed 1.9 kilograms. The abdomen contained about 50 cubic centimetres of free fluid. The viscera appeared normal, with the exception of the genito-urinary tract. The kidneys were swollen and of nutmeg appearance. The left kidney measured 3.6 by 2.1 by 0.17 centimetres and weighed 7.8 grammes. The right kidney measured 3.6 by 2.2 by 1.4 centimetres and weighed 7.2 grammes. The ureters were somewhat thickened. The bladder contained 7.0 cubic centimetres of urine, which contained albumin and numerous casts. The bladder wall was thick and weighed 3.0 grammes. The prostatic urethra seemed to be reduced in size as compared with the preexperimental X ray appearance. Its measurements were 4.0 by 2.5 by 2.0 centimetres, and it weighed 7.8 grammes. It was smaller than that seen in controls of similar size. As in the previous animal (possum 6 and controls), two areas could be observed externally and three areas when the organ was sectioned. The lumen of the urethra was narrower than in normal controls, and the epithelium lining was thrown into numerous folds.

Microscopic Findings.—In zone A definite squamous metaplasia was observed in the prostatic ducts leading to the urethra. The acini showed definite epithelial hyperplasia, while many of the cells lining the acini were vacuolated. The fibrous tissue seemed to be increased. Zone B showed a more or less uniform hyperplasia. There was no evidence of metaplasia in this zone, and the epithelial cells were not vacuolated. The interstitial fibrous tissue was increased. No definite hyperplasia or metaplasia was noted in zone C, but the interstitial fibrous tissue was increased in amount.

The microscopic picture shown by the kidneys was similar to that seen in possum 6.

Possum 10.—Possum 10 was a young immature male. The approximate age was about one year. The body weight was 1.27 kilograms. The testes were small and measured about 0.5 centimetre in diameter. Several urine specimens were obtained, none of which showed any spermatozoa.

On July 20, 1938, 15,000 units of oestrin were injected intramuscularly. Eight further similar injections were given at weekly intervals for the next two months. During this period the urine was frequently examined, but no spermatozoa were found at any stage. After the first five injections it was noted that the animal began to lose weight and its eyelids appeared oedematous. After a total of eight injections the animal seemed to be unable to produce a stream on micturition and only a dribble was forthcoming. On September 18, 1938, the animal suddenly died.

Post Mortem Findings.—The body weighed 1.1 kilograms. The abdomen was distended and there was oedema around the eyes. A blood specimen obtained about six hours after death contained 92 milligrammes per centum of urea. When the abdomen was opened the stomach was found to be greatly distended with fluid and gas. Otherwise the viscera appeared to be normal, with the exception of the genito-urinary tract. The kidneys appeared enlarged. The right kidney measured 3.0 by 1.8 by 1.2 centimetres and weighed 4.6 grammes. The left kidney measured 3.1 by 1.7 by 1.5 centimetres and weighed 4.8 grammes. Both ureters showed early dilatation of the upper and lower fifths. The bladder was thick walled and almost empty. The prostatic urethra was quite small. It measured 2.5 by 0.9 by 0.8 centimetres and weighed 1.25 grammes. On longitudinal section the three different areas were noted, as previously mentioned. The urethra consisted of a very narrow channel about 0.5 to 1.0 millimetre in width.

Microscopic Findings.—Serial sections were prepared of the upper fourth of the prostate, including the base of the bladder area A and some of area B. The bladder epithelium over the prostatic area showed squamous metaplasia.

Zone A exhibited metaplasia. There was squamous stratified epithelium lining the urethra, prostatic ducts and alveoli. This change was most marked near the urethra. The alveoli and ducts showed plugs of keratin, desquamated cells and leucocytes. There was marked interstitial fibrosis. Several papilliform structures were observed projecting into the urethra. One of them was very typical in that it possessed a vascular connective tissue core and was covered with stratified squamous epithelium. This papilliform projection was found to be connected with the urethra near the anterior end of the prostate (see Figure VI).

In zone B the urethral mucosa showed a metaplasia from transitional to squamous stratified epithelium, as observed in zone A. The urethral epithelium was thrown into folds with deep crypts. The adjoining prostatic ducts were dilated and were lined by squamous stratified epithelium containing some keratin plugs, some of which had been invaded by leucocytes. Towards the periphery the prostatic alveoli were small and were lined by squamous epithelium several layers thick. They also contained keratin plugs. Interstitial fibrosis, although marked, was less pronounced than in zone A.

Zone C on the whole resembled zone B. The urethral epithelium was thrown into folds as observed higher up in the organ. The interstitial fibrosis was confined to the perilethral tissue. The peripheral prostatic alveoli were larger than they were in zone B.

In zones B and C there was a marked tendency to formation of cystic spaces lined by squamous stratified epithelium.

Possum 13.—Possum 13 was a young immature male. The approximate age was ten months and the body weight 1.2 kilograms.

On October 31, 1938, 8,000 units of "Oestroform" were injected intramuscularly. Then fourteen further similar injections were given at weekly intervals. After ten injections the animal showed loss of weight and urinary

incontinence and oedematous eyelids as observed in previous experiments.

On February 3, 1938, the animal, being moribund, was killed. The blood urea content was 194 milligrammes per centum.



FIGURE VIII.

Possum 9. Showing marked hydroureters and moderate hydronephrosis.

Post Mortem Findings.—When the abdomen was opened markedly dilated ureters were seen (Figure IX). The kidneys were not enlarged, but on section they showed definite hydronephrosis. The prostate was very small, measuring 2.3 by 0.9 by 1.1 centimetres, and weighed 1.2 grammes. The bladder wall was very thick and contained a calculus of about 0.8 centimetre in diameter, weighing 0.4 gramme. On analysis it proved to be mixed calculus, consisting mainly of oxalates and phosphates.

Microscopic Findings.—Sections from the various zones showed predominantly squamous metaplasia, with a tendency to cystic formation, as in possum 10. Some areas displayed mainly epithelial hyperplasia.

Possum 14.—Possum 14 was a half-grown animal and weighed 0.73 kilogram at the beginning of the experiment. Eighteen weekly injections of 700 units ("Cestroform") were administered—a total of 12,600 units. After the eighth injection the animal gradually became weaker and its movements more feeble. It died after 120 days. The final weight was 1.2 kilograms.

The post mortem examination revealed well-marked bilateral dilatation of the ureters (the lumen of each being 0.5 centimetre in diameter). The kidneys weighed 7.0 grammes and appeared mottled. There was early dilatation of the renal pelves with flattening of the renal papillae. The blood urea was 100 milligrammes per centum. The bladder was thick walled and contained four oxalate calculi, together weighing 0.4 gramme. The prostate was somewhat reduced in size, and firm, weighing 4.3 grammes. The prostatic urethra was narrow and contained a calculus (0.18 gramme), also composed of oxalates, just below zone A. The penis, testes and scrotum were atrophic. The microscopic sections of prostate and kidneys presented the same appearance as did those of the other laboratory animals.

Discussion.

The Animals Used for Experiment.

All the animals used were healthy and vigorous, but their ages varied considerably, and with the exception of the immature possums they were unknown. The fully grown possums exhibited spermatorrhoea, which we considered a sign of sexual maturity.⁽¹⁵⁾ The different experiments were commenced over a period of six months (June–December, 1938) and so far no definite seasonal influence on the experiments could be detected.

Dosage and Survival Period.

As shown in Table II, the weekly dosage of oestrin administered by the intramuscular route was large and varied from 700 to 50,000 international units. These weekly injections were kept up till the animal died, and death occurred after the administration of a total amount varying from 13,600 to 450,000 units.

Seven of the ten possums died after the injection of a total dosage ranging from 120,000 to 170,000 units. This high lethal dosage was characterized by either a short or long survival period, while the intervening survival period (55 to 65 days) was observed with two other animals which had very large weekly injections (possums 9 and 11). How-



FIGURE IX.

Possum 13. Showing marked hydroureters in situ.

ever, the animal in experiment 14, which had received much smaller weekly injections, lived the longest. These findings would indicate that in the present series of experiments dosage and survival period are not related.

Functional and Anatomical Findings.

Functional Findings.—Spermatorrhoea, a physiological manifestation observed in all sexually mature healthy males, ceased after one to three weekly injections of about 50,000 units of "Cestroform". With smaller doses it took about a month

to arrest spermatorrhœa. The pathological nature of the arrest of spermatorrhœa was further supported by the histological examination of the testicles of our animals. They all showed absence of spermatogenesis. This agrees with observations on other mammals, in which it has been shown that large doses of œstrin interfere with spermatogenesis.

Possums 5, 6 and 7 died within 13 to 24 days. They form a distinctly separate group, as will be pointed out later. Their urinary findings shortly before death were characterized by the presence of a large number of casts and albumin.

Of the remaining animals which lived for longer periods, the immature ones (10, 11, 13 and 14) exhibited a marked retardation in growth during the experiment. In experiment 14, for example, the body weight increased from 0.73 kilogram at the beginning of the experiment to only 1.2 kilograms after 122 days, while an untreated possum of the same age more than doubled its weight over the same period. From this observation one might suspect an influence on the growth-promoting hormone of the pituitary.

The animals surviving for longer periods (experiments 8 to 14) had smaller amounts of albumin and rarely casts in their urine. Towards the end of the experiment the urine became watery in appearance and its urea content was frequently found to be low. For example, in possum 8 the urea content was 4% to 6% before the experiments. A few days before death it was found to be only 1%. In addition, all these animals showed progressive emaciation and lethargy, œdema around the eyes, and urinary incontinence towards the terminal stage.

Blood urea determinations were performed pre-experimentally and the content was found to range from 25 to 40 milligrammes *per centum* in these animals. Again blood urea determinations were performed shortly before death or immediately after the death of the animal. In all experiments, irrespective of survival period, a markedly raised blood urea content was found. In six animals the blood urea values ranged from 194 to 800 milligrammes *per centum*, and therefore one can conclude that the death of these animals was mainly due to renal insufficiency or urinary obstruction. Possum 6 (blood urea 133 milligrammes *per centum*) was killed before the terminal stage was reached, and in the remaining animals, which did not show very great urea retention, non-renal complications brought on death. For example, possum 10 died from acute dilatation of the stomach.

Anatomical Findings.—As pointed out before, experiments 5, 6 and 7 have to be considered separately. These animals died of an acute toxic nephritis, as shown by microscopic examination of the kidneys and also by elevated blood urea values. This particular action of large doses of œstrogens on the kidney will be discussed on another occasion in relation to a large series including females. At autopsy the remaining seven animals which survived this stage showed little evidence of this toxic

nephritis, and the changes met with in the kidney, such as dilated tubules, can be best explained by obstruction in the urinary tract, and we shall shortly deal with this subject.

As would be expected from reports of similar experiments on other mammals (1 to 7 inclusive), marked gross and microscopic changes were found in the prostate gland. However, in contrast to most of these findings by other authors in which an increase in the size of the prostate has been reported, the possum showed a reduction in size and weight of the prostate in all experiments, with the large doses employed (Table III) (Figure X). A similar reduction in size, even in experiments of short duration, has recently been observed by Noble⁽¹⁶⁾ in experiments with rats which were injected with an artificial œstrogenic substance (diethyl stilbœstrol). This reduction in size of the marsupial prostate is most marked in zone C and least in zone A.



FIGURE X.

Possum 7. Photograph to show the reduction in size of the prostate following œstrin injections. (Compare with Figure I.)

Increased interstitial fibrosis throughout the gland was seen in all experiments, but particularly in those in which a long survival period was noted. It was most abundant around the urethra, and particularly in the proximal area (zone A) (Figure XI). This agrees with the observations of Zuckermann and others that fibrosis of the prostate as produced by œstrogens in apes and dogs is found to be concentrated in the vicinity of the prostatic utricle and ejaculatory ducts.

Epithelial changes as observed in the possum were similar to those reported in mice, dogs *et cetera*, and to a lesser extent in apes. In the male mouse treated with oestrin, Burrows⁽³⁾ distinguished between four stages: (A) arrest of secretion, (B) epithelial hyperplasia, (C) metaplasia and (D) keratinization and suppuration. With regard to A, we did not observe a characteristic arrest of secretion, but, as mentioned before, the prostates became smaller, even in experiments which had lasted only a few weeks. This may well be due to a diminished secretion and subsequent diminution in size and weight of the tubules and acini. With the exception of experiment 6, in which the prostate showed mainly epithelial hyperplasia (stage B), stages B, C and D were present in varying degrees. Stages C and D (metaplasia and leucocytic infiltration) were very marked in degree and predominated in the experiments (experiments 10 to 14). The acini became filled with masses of stratified epithelium and keratin undergoing aseptic suppuration to such a degree that the original structure of the gland was lost. The extensive metaplasia and fibrosis throughout the gland, and especially in zone A, are regarded as the cause of the obstructive sequelae discussed below.

Bilateral hydronephrosis and hydronephrosis occurred in nearly all animals with a long survival period. The finding of vesical calculi in possums 13 and 14 is further evidence of obstruction at the bladder neck. In experiment 14, in addition to the calculi found in the bladder, a calculus was found lodged in the prostatic urethra. In all these animals the urinary obstruction led to renal insufficiency, as shown by elevated blood urea and finally death.

Possum 11, which received the highest dosage of oestrin, was an exception in that it showed only early urinary obstruction at *post mortem* examination. In the terminal stages of the experiment, however, it showed marked marasmus.

These findings, that is, hydronephrosis and hydronephrosis, agree with the observations by Lacassagne⁽¹⁾ and Burrows and Kennaway⁽²⁾ in male mice which had been treated with oestrogenic substances.

In addition to the stages described, a fifth stage (E) has been observed, characterized by pre-carcinomatous features. Such a condition has already been described by de Jongh and Kok,⁽⁴⁾ who obtained in a dog prostate treated with oestrone "a condition reminiscent of the dermal extensions of benign papillomatous growth". Similar observations were made by us in possums 8 and 10. The latter showed the development of a true squamous papilloma in addition to squamous overgrowth in the surrounding tissue (Figures VI and XII). From these observations we do not wish to imply that carcinoma of the prostate is necessarily a result of hormone imbalance, especially as prostatic carcinoma of the squamous variety is unusual. Furthermore, it has to be pointed out that at this stage of our experiments no definite deductions can be made regarding the problem of benign hypertrophy of the prostate as observed in man, owing to the anatomical

dissimilarity of the prostate of marsupials and higher mammals. But it is of interest to note that Moore and McLellan,⁽¹⁷⁾ after the administration of "Estradiol" to subjects with benign prostatic hypertrophy, produced "conspicuous alteration in the urethral and ductal epithelium but little if any change in the tissues of benign hypertrophy".

Summary.

1. The normal prostate of the common possum (*Trichosurus vulpecula*) is described in detail.

2. The effect of injections of oestrogenic material on ten male possums has been studied.

3. All experiments terminated fatally. Experiments in which a short survival period was noted were characterized by toxic changes in the renal parenchyma. In the experiments with a longer survival period six animals developed hydronephrosis and hydronephrosis, while in addition two showed vesical calculi.

4. The prostate gland was not increased in size in any of the experiments, but on the contrary was small.

5. The histological changes observed in the prostate gland included fibrosis, most marked around the urethra, epithelial changes, such as hyperplasia, metaplasia, and keratinization, and in one experiment the development of an intraurethral papilloma.

Acknowledgements.

We wish to acknowledge our indebtedness to Dr. E. Day and Miss J. Fraser Thompson for the blood urea estimations, British Drug Houses Limited for supplies of hormone, Mr. Woodward Smith for photography, and Mr. J. Kerr for microscopic sections.

References.

- ⁽¹⁾ A. Lacassagne: "Métaplasie épidermoïde de la prostate provoquée chez la souris, par des injections répétées de fortes doses de folliculine", *Comptes rendus de la Société de biologie*, Volume CXIII, 1933, page 530.
- ⁽²⁾ H. Burrows and N. M. Kennaway: "On Some Effects Produced by Applying Oestrin to the Skin of Mice", *The American Journal of Cancer*, Volume XX, 1934, page 48.
- ⁽³⁾ H. Burrows: "The Localisation of Response to Oestrogenic Compounds in the Organs of Male Mice", *The Journal of Pathology and Bacteriology*, Volume XLI, 1935, page 423.
- ⁽⁴⁾ "Pathological Conditions Induced by Oestrogenic Compounds in the Coagulating Gland and Prostate of the Mouse", *The American Journal of Cancer*, Volume XXIII, 1935, page 490.
- ⁽⁵⁾ S. Zuckermann and A. S. Parkes: "The Effects of Oestrone on the Prostate and Uterus Masculinus of Various Species of Primates", *Journal of Anatomy*, Volume LXX, 1936, page 323.
- ⁽⁶⁾ R. Courrier and G. Gros: "Action de la folliculine chez le singe mâle imputé. Apparition d'une peau acnéique", *Comptes rendus de la Société de biologie*, Volume CXVIII, 1935, page 583.
- ⁽⁷⁾ S. Zuckermann and J. R. Groome: "The Aetiology of Benign Enlargement of the Prostate in the Dog", *The Journal of Pathology and Bacteriology*, Volume XLIV, 1937, page 113.
- ⁽⁸⁾ L. J. Wells: "Effects of Oestrin Injections on Accessory Reproductive Organs in the Male Ground Squirrel (*Citellus tridecemlineatus*)", *The Anatomical Record*, Volume LXIV, 1936, page 475.
- ⁽⁹⁾ L. A. Van der Woerd: Quoted by S. Zuckermann, *Proceedings of the Royal Society of Medicine*, Volume XXIX, 1936, page 1567.
- ⁽¹⁰⁾ S. Zuckermann: "Embryological Interpretation of Changes Induced by Oestrogens in the Male Reproductive Tract", *The Lancet*, Volume I, 1935, page 135.
- ⁽¹¹⁾ J. T. Oudemans: "Die accessorischen Geschlechtsdrüsen der Säugetiere", *Naturkundliche Verhandlungen von der Hollandsche Maatschappij der Wetenschappen (Haarlem)*, 1892.
- ⁽¹²⁾ R. Disselhorst: "Die männlichen Geschlechtsorgane der Monotremen und einiger Marsupialien", *Seminar Zoologische Forschungsreisen*, Volume IV, 1904, page 121.
- ⁽¹³⁾ A. J. P. Van den Broek: "Untersuchungen über den Bau der männlichen Geschlechtsorgane der Beuteltiere", *Morphologisches Jahrbuch*, Volume XLI, 1910, page 347.

¹⁰² W. C. MacKenzie: "The Comparative Anatomy of Australian Mammals", Part IV, 1919, page 86.

¹⁰³ M. G. Fordham: "The Anatomy of the Urogenital Organs of the Male *Myrmecobius fasciatus*", *Journal of Morphology*, Volume XLVI, 1933, page 331.

¹⁰⁴ A. Bolliger and A. Carrodus: "Spermatorrhoea in *Trichosurus Vulpecula* and other Marsupials", *The Medical Journal of Australia*, Volume II, 1933, page 1118.

¹⁰⁵ R. Noble: "Functional Impairment of the Anterior Pituitary Gland Produced by the Synthetic Oestrogenic Substance 4:4' dihydroxy- α : β -diethylstilbene", *The Journal of Physiology*, Volume XCIV, 1933, page 177.

¹⁰⁶ R. A. Moore and A. M. McLellan: "A Histological Study of the Effect of the Sex Hormones on the Human Prostate", *The Journal of Urology*, Volume XL, 1933, page 641.

THE INFANT WELFARE MOVEMENT IN AUSTRALIA.

By W. G. ARMSTRONG, M.B., Ch.M., D.P.H.,
Sydney.

THERE have appeared lately in both the medical and the lay Press statements as to the origin of infant welfare activities in Australia which are inaccurate and of such a nature as to reflect unfavourably upon the work of the Department of Public Health of New South Wales. I have therefore thought it proper to record briefly, but as comprehensively as possible without trespassing unduly upon valuable space, the facts which led to and accompanied early infant welfare activities in New South Wales. For it was in the State of New South Wales that infant welfare work first was established in the southern hemisphere, and it was derived from and modelled upon the operation of similar activities in England and France at the close of the last and in the early years of the present century. New Zealand came into the picture only several years after the work was begun in New South Wales, and then not as an exemplar but as a competitor in a good cause—a competitor whose efforts no doubt spurred us on to still further pains but did not originate or suggest the methods employed here.

The death rate for infants is probably the most sensitive index we possess of the physical welfare of a town or nation and of the effects of hygienic control. The cities of Australasia are proud of the fact that they have the lowest infantile mortality rates in the world. This was not always the case. As late as the year 1885 in most of the large cities of Australasia the infant mortality rate was greater than that of London and as high as in most of the world's great cities, and it is only since that year, and more especially since the beginning of this century, that the relative improvement in our rates has taken place. It is interesting to discuss the nature of this fall in order to ascertain, if possible, the reasons for it. To do this it will be necessary to describe what action has been taken in New South Wales to check the high mortality rate among young children.

The subject of infant mortality is one which has always deeply interested me since I first began private practice in 1888; and when I visited England in 1894 and 1895 to study public health, I devoted

a portion of my time to inquiries as to what action had been taken to deal with the problem of infant mortality in that and other European countries. On my return to Australia with the newly acquired Cambridge diploma of public health I was appointed in 1898 to the position of medical officer of health to the combined metropolitan district of Sydney. I felt myself committed to attempt something in mitigation of what appeared to me as a serious state of affairs; but suitable action was delayed for a few years by my preoccupation with an invasion of plague with which Sydney was afflicted at the beginning of this century.

My inquiries as to any concerted action for the reduction of infant mortality in England had not been very fruitful. No public body had ever taken the matter up prior to 1895. It is true that in the eighteenth century three distinguished physicians, William Cadogan (1711 to 1797), George Armstrong (1755 to 1830) and John B. Davis (1780 to 1842), had each in his time taught and written considerably on infant welfare, and Armstrong had actually opened and largely maintained at his own expense in Red Lion Square, London, a "Dispensary for the relief of the Infant Poor", at which in twelve years ended 1781, 35,000 children had been treated. All three of these men strongly advocated the importance of breast feeding, and they did a great deal for the promotion of infant welfare; but they were isolated pioneers in advance of their time and originated no public movement. Meanwhile it was beginning to be appreciated that summer diarrhoea was one of the main factors in infant mortality, and Longstaff in 1880, and Ballard in his report to the English Local Government Board, 1885, published important papers on the subject. It remained, however, for Newsholme (now Sir Arthur Newsholme), then medical officer of health for Brighton, in his presidential address to the Society of Medical Officers of Health in November, 1899, to put before the English public health authorities a well-reasoned, thoughtful summary of the causes of epidemic or summer diarrhoea. Briefly he showed that summer diarrhoea was a filth disease due to the contamination of infants' food, usually in the home. This address was undoubtedly one of the influences which did most to bring about the infant welfare movement in England. Meanwhile in France matters were much more advanced. The rapidly falling birth rate and the threatened consequent decline in population had greatly stimulated public concern over the pitiful wastage of infant life and led to the adoption of special measures of prevention, which were a distinct effort in advance of anything that had been done or attempted in England. The first dispensary for infants was established in 1875 in the town of Le Havre by Dr. Gibert. Its object, like that of Armstrong's dispensary in London in olden days, was to provide medical treatment for sick babies without taking them away from their homes, and a few similar institutions were established in other French towns. But it was in the last ten years of the nineteenth century that the *consultation de nourrissons* appeared and domi-

nated the whole field of infant welfare work all over the world for many years. Its creator, Dr. Pierre Budin, was professor of clinical obstetrics at the *Charité* hospital in Paris; but during the last fifteen years of his life he devoted most of his time and energy to the infant welfare movement. In 1892 the first *consultation de nourrissons* was established by Budin at the *Charité*. This was a clinic to which mothers brought their babies every Friday morning to be examined by Budin. The children were examined and weighed. Mothers were urged to breast feed their children; and when, and only when, breast feeding was manifestly insufficient a varying quantity of sterilized milk was provided, for which the mother called or sent every morning. Full instructions were given to mothers as to how to treat and feed their infants. In fact the *consultation* was a real school for mothers, limited, however, to mothers who had been confined at the *Charité*.

More of these *consultations* were soon established by Budin at other hospitals, and by 1898 there were several of them in Paris. In 1894 Dr. Léon Dufour began a similar movement in the French provinces under the name of *gouttes de lait*, the first being established at the town of Fécamp, near Havre. In the provinces the *gouttes de lait* were not attached to any hospital, but were independent institutions supported by private subscriptions. The objects of these institutions were as follows: (i) to keep under regular medical supervision, with weekly weighing and examination, children during the first two years of life; (ii) to encourage and urge breast feeding; (iii) to provide specially prepared cow's milk for the infant for whom breast feeding was impossible. The milk was supplied to the mother either gratuitously or at a reduced price, according to her financial position. The *gouttes de lait* became very popular, and were established in many of the French provincial towns. I was able to visit Fécamp in France during the year 1895, and inspected the *goutte de lait* which was established in that town and had the working explained to me; I also visited Budin's *consultation* at the *Charité* hospital in Paris on several occasions and was deeply impressed by his methods.

The movement initiated in France was not long in extending itself to America and later to England. In the former country the names of Nathan Strauss and Dr. Henry Coit will always be associated with the establishment and maintenance of infant milk depots in the States of New York and New Jersey.

In England an attempt to copy French methods was first made by the municipal council of the town of St. Helens on the advice of its medical officer of health, Dr. F. Drew Harris. A milk depot was opened in August, 1899. On its arrival at the depot the cow's milk was modified to approximate its composition to that of human milk, then put into bottles and sterilized; the bottles were placed in baskets, each basket containing nine bottles, or enough to provide a child with nine feeds in twenty-four hours.

It was supplied at a charge of twopence for each nine bottles, a sum that barely covered the cost of materials. On Wednesday afternoons the mothers were expected to bring their babies to be inspected and weighed. Dr. Harris reported very favourably on the results of the first year's work, and very soon many English towns followed the example of St. Helens. The most notable of these was the borough of Battersea, of which Dr. G. F. McCleary was medical officer of health, and the well-known philanthropist and social reformer, John Burns, the parliamentary representative. Dr. McCleary's work in connexion with the infant welfare movement has always been indefatigable and conspicuous, and his history of the early days of the infant welfare movement in England is deeply interesting. I am indebted to him for several of the facts I have stated here.

In the early days of the Battersea depot an infant consultation formed no part of the work; but later, in 1905, Dr. McCleary began to hold a consultation for the babies fed on the depot milk. This was the first baby clinic established in England. Before this time the public infants' milk depots in England were not associated with the medical consultations that were an important feature of the French *gouttes de lait*, and to that extent they were inferior to them; but they did a very valuable service by attracting public attention to the need for preventive effort and by stimulating both medical and lay efforts in the right direction. The infant welfare movement developed rapidly in England, and by the end of 1905 an increasing number of municipal authorities, including Sheffield, Birmingham and some fifty others besides those I have already mentioned, had either established baby clinics or were employing health visitors to visit newly born children and give instruction to mothers in the feeding and care of infants.

I believe I was the first person in Australasia to adopt systematic measures for the control of infant mortality. This was in the year 1904. I was then medical officer of health to the metropolitan combined district of Sydney and city health officer, and I was influenced greatly in the action I took by what I had read and seen personally of the fight against infant mortality in France, particularly by Budin's methods, and by Newsholme's presidential address in November, 1899. I found myself less impressed by the importance of establishing milk depots than by that of educating mothers, and especially young mothers, in mothercraft, and I considered that action in this direction would have much greater value than the issue of a dole of prepared milk to mothers who might lack the ability or the energy to take the trouble to come for it. Moreover, my idea was to encourage breast feeding in every possible way and not to afford facilities for the use of cow's milk or other artificial food. I had previously (in 1903) issued a brief pamphlet of "advice to mothers", a copy of which I had sent to every address in the city at which a birth had been registered. In 1904 I obtained from

the City Council of Sydney authority to employ on my staff a trained health visitor to visit personally and instruct the mothers of all newly born babies in the city who were not under direct medical care. Fortunately a most suitable person was available in Miss Margaret Ferguson. She had qualified as a health visitor by obtaining the certificate of the Royal Sanitary Institute and had had two years' experience under my direct control in general health visiting in the poorer parts of Sydney. She was accordingly appointed to the position and began her new duties in the beginning of May, 1904, the City Council undertaking to supply me with further assistance as I found it necessary.

The campaign in Sydney was essentially educational in its scope. My aim was the visiting of every mother of a new-born child in the city, with the exception of those who were under the personal care of a medical attendant. A daily list of all births registered was obtained from the registrars, and within a day or two after registration the house of each child was visited by the health visitor, who interviewed the mother, talked to her confidentially on the management of the child, and advised her as to the methods she ought to follow. The principal points impressed on the mother were the great importance of breast feeding and its superiority over any other form of feeding. Should breast feeding be found impossible, the use of properly modified boiled or scalded cow's milk was advised, and warnings were given against the long-tubed bottle, the "dummy" or "comforter", and the use of starch and patent foods. The conditions as to cleanliness and the general sanitary state of the dwelling were noted and reported at my office for any necessary action. Full records were kept in each case, and if necessary, in cases of poverty, the household was referred to the appropriate charitable institutions and supplies of milk, food, blankets or other necessities were arranged for. At each home a copy of a brief and simply worded pamphlet, setting forth the dangers of infantile diarrhoea and giving instructions as to the feeding and management of infants, was handed to the mother. This pamphlet strongly stressed the importance of breast feeding. In fact the slogan of the whole campaign was: "There is no feeding equal to breast feeding." If any child was found to be sick or ailing by the health visitor the only advice given was: "Get a doctor at once or take him to a hospital." No responsibility of advising treatment was permitted in cases of illness.

Without exception the domiciliary visits were well and gratefully received; and in many cases mothers who were contemplating weaning or partially weaning their infants were dissuaded from so doing, and in many instances, even when the process of weaning had begun, the visitor was able to prevail on the mother to go back to full breast feeding, which upon a later visit was found to be proceeding satisfactorily.

The following year (1905) I was invited to become president of the Section of Public Health in the seventh session of the Australasian Medical Congress held at Adelaide. I chose as the subject of my presidential address "Infantile Mortality in Sydney"; in this I discussed the whole question of infant mortality in Australia as far as my knowledge availed me, and I gave a detailed account of the methods I had adopted to combat infant mortality in Sydney and urged the introduction of similar measures into Adelaide and the other large cities of Australia. I was also asked by the congress to deliver a popular public address at the Adelaide Town Hall on "Some Aspects of Municipal Sanitary Administration". I devoted a large section of this address to the subject of infant welfare, and made a strong appeal for the adoption in Australian cities of a campaign for the reduction of infant mortality—a question which I at that time considered to be the most important public health movement in Australia.

For eleven years I pursued in Sydney the methods I have described. Table I indicates the results which were obtained in the city of Sydney, with a population during that period of from 112,000 to 113,500, and in some of the adjacent industrial suburbs. During those years the infant mortality rate continuously and rapidly fell; and though one may have doubts as to whether the whole of the fall was due to this action, one cannot escape from the belief that it had a powerful share in it. The progressive education of the mothers was, of course, the dominant factor.

In view of the satisfactory results achieved by health visiting in the city of Sydney, and particularly by the progressive annual increase in breast feeding, which was incontestably due to the campaign, the New South Wales State Department of Public Health, on my urgent representation, increased my personal staff as medical officer of health in the year 1909 by allowing me at first one and later two health visitors for precisely similar work in the more populous of the industrial

TABLE I.
Records of Newly Born Children visited in the City and Suburbs of Sydney, 1904 to 1914.

Children.	Year.										
	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
Number visited ..	781	1,455	1,240	1,272	1,175	2,636	3,653	3,549	4,686	3,891	4,425
Entirely breast fed ..	564	1,114	977	1,019	958	2,836	3,042	3,008	4,026	3,522	4,166
(72.2%)	(76.5%)	(78.6%)	(80.1%)	(81.5%)	(82.6%)	(88.5%)	(84.7%)	(85.5%)	(85.5%)	(90.5%)	(94.1%)
Partially breast fed ..	166	250	210	202	175	214	231	200	444	245	155
Entirely artificially fed ..	51	91	53	51	42	31	32	32	216	121	104

suburbs immediately surrounding the city. Mrs. B. E. Cooper-Day was selected for the first position. She also was a qualified sanitary inspector and had previously had a wide experience of a somewhat similar class of work in the State Children's Relief Department. Like Miss Ferguson, she was an indefatigable and enthusiastic worker and proved a most valuable addition to my staff. She was placed in charge of the suburbs of Redfern, Darlinghurst, Glebe, Alexandria, North Botany (now Mascot) and Botany—all highly industrial working class and closely populated districts to the south of the city, and at that time having a total population of 99,870 persons. Her duty was to visit every home where a birth was registered in these districts and to take similar action to that pursued in the city whenever there was no doctor in charge of the case. Still later I added to my visiting staff Miss C. M. Burne, ex-nursing sister of the Coast Hospital, and later to become matron, first of the Lady Adeline Hospital for Babies and afterwards of the Coast Hospital; she was appointed for work in the suburbs, which was increasing rapidly and proving most successful. She took up the work in the suburbs of Annandale, Balmain and Leichhardt, with a combined population of 72,442.

It emerges from Table I that during the eleven years of the campaign 28,763 new-born babies were visited by my staff of health visitors in the city and suburbs of Sydney. During that period the infant mortality rate of the whole of the metropolitan district fell from 116 per 1,000 births in the year 1903 to 68 per 1,000 births in 1914. The proportion of breast feeding among the mothers visited increased from 72% in 1904 to 85.3% in 1912, and to 94% in 1914. (But the surprising gain in the last two years is partly discounted by the fact that the introduction of the baby bonus caused an earlier registration of births in 1913 and 1914.) Thus it was found that between the years 1904 and 1912 the average time after the birth that the first visit was paid was 5.3 weeks. After 1912 the baby bonus of £5 began to be distributed to all mothers of newly born children by the Commonwealth Government. One result of this was that the parents lost no time in registering their children's births and applying for the bonus, and the average time elapsing between the birth of the child and the visit fell to three weeks in 1913 and 2.3 weeks in 1914.

The increase in breast feeding up till the year 1912 and a large proportion of the increase in 1913 and 1914 are attributable entirely to the effects of the campaign in educating the mothers.

On February 15, 1915, an act known as *The Early Notification of Births Act* was assented to in New South Wales. It provided that births occurring in proclaimed districts should be notified to the Department of Public Health within thirty-six hours of the birth. It was proclaimed immediately in the metropolitan and Hunter River districts of the State.

I was much assisted in the later years of the campaign by the institution known as the Alice

Rawson School for Mothers, which was established in Sydney in the year 1908 at the instigation of the National Council of Women and named after the daughter of the then Governor of New South Wales. It was supported partly by voluntary subscriptions and partly by a Government subsidy of £250 a year, and had rooms in Bourke Street, Darlinghurst, which were open every afternoon for mothers to bring their babies to be weighed and get practical advice about their feeding and treatment. Later an additional school was opened in Newtown and a third in Alexandria. The nurses attached to the institutions were also available on request to visit the mothers of young babies in their own homes, and they frequently assisted my staff by taking over and visiting babies who were artificially fed and who seemed to require more attention than could be spared them by the health visitors, or who were losing weight and required regular weighing.

The close of the year 1913 was marked by the establishment by the New South Wales Government of the Lady Edeline Hospital for Babies at "Greycliffe", Vaucluse. This hospital owed its existence to the Honorable Frederick Flowers, who was the first Minister for Public Health in the New South Wales Government. The building is a very handsome freestone mansion erected about the middle of last century, and was originally the house of Mrs. Fanny Reeve, the daughter of William Charles Wentworth. It was acquired by the Government as part of a scheme to resume, whenever an opportunity occurred, private lands on the foreshores of Sydney Harbour. The situation is very beautiful. The building has a north-easterly aspect and is situated about 200 yards from the waters of Port Jackson. It is protected by high land from the southerly and westerly winds and is surrounded on all sides but that facing the harbour by a well laid out public park. The building was converted into a hospital for babies suffering from gastro-enteritis, and it possessed accommodation for fifty babies. The institution was maintained by the Government and was placed under the control of the Department of Public Health assisted by a ladies' committee. The staff consisted of five honorary medical officers, a matron, three sisters and six pupil nurses who were undergoing training in baby nursing. The average duration of the treatment of the little patients in hospital was 29 days, and after their discharge from hospital treatment was continued at a weekly clinic held at the offices of the Department of Public Health, where the mothers attended regularly until the children had completely recovered. (It is to be noted that this hospital continued to serve its purpose as a hospital for babies suffering from gastro-enteritis until the year 1934, by which time gastro-enteritis as a disease of babies had declined so greatly in Sydney that it was felt that the need for the hospital no longer existed. On March 1, 1935, the building was accordingly handed over to the Royal Society for the Welfare of Mothers and Babies to be used as a mothercraft home.)

In the year 1914, on the retirement of Dr. J. Ashburton Thompson from the position of chief Government medical officer and his succession by Dr. R. T. Paton, I was transferred from the Town Hall to the head office of the New South Wales Department of Public Health, and, much to my regret, it appeared that I should have to dissociate myself from the infant welfare campaign. However, the then newly constituted Minister of Public Health, the Honorable Frederick Flowers, after consulting me, decided to continue and expand the movement generally throughout New South Wales and to associate with it the Alice Rawson School for Mothers and other bodies with cognate activities under Government supervision and with Government financial backing. As a preliminary measure he convened a conference of the representatives of all bodies concerned in infant welfare work in Sydney. The following bodies were represented at the conference which took place on June 17, 1914: the Departments of Public Health and Public Instruction were each represented by their chief medical officers; the Sydney District Nursing Association was represented by Dr. (afterwards Sir) C. B. P. Clubbe and Mrs. L. M. Antil, the Alice Rawson School for Mothers by Dr. (now Sir Charles) Blackburn, Dr. Guy Griffiths, Mr. W. P. Faithfull, Miss A. M. Friend and the Reverend W. A. Charlton. I was unable to be present through illness; but my successor as medical officer of health, Dr. J. S. Purdy, took part in the conference and described the infant welfare campaign which had been carried on by me from the Town Hall for eleven years, and the great assistance given thereto by the Alice Rawson School for Mothers. The whole subject was fully discussed, and the Minister, after consultation with Dr. Clubbe, the distinguished paediatrician, announced that he had decided to establish in suitable districts baby clinics or infant consultation centres on the lines of the baby clinics which had been in operation in England and France for several years. He would administer them himself with the aid of a baby clinic board to advise him. A board was accordingly gazetted consisting of Dr. P. B. Clubbe, Dr. R. T. Paton, the Director-General of Public Health, Mr. N. Mayman, the President of the Benevolent Society of New South Wales, Miss Alice Friend, secretary of the Alice Rawson School for Mothers, and Mrs. Jessie Dickie. Dr. Clubbe was appointed chairman of the board.

The Minister laid it down as his policy that there should be established in suitable districts baby clinics or infant consultation centres, where the expectant mothers might keep in touch with the clinic doctor right up to the time of crisis, when accommodation would be found for her in one of the women's hospitals or arrangements would be made for her confinement in her own home. When the baby was born the mother would be visited in her own home by a clinic nurse, whose first duty would be to impress upon the mother the importance of breast feeding. Later the baby would be brought at fixed intervals to the clinic and there weighed.

If the proper gain in weight was lacking or if the baby did not thrive, the mother would at once be urged to obtain medical advice. At each visit the clinic nurse would advise the mother generally as to the feeding and management of the baby.

The personnel of each baby clinic was to consist of an honorary physician and two nurses. It was to be no function of a baby clinic to treat any disease condition, and any baby suffering from illness would at once be sent to a hospital or to its own doctor. One of the two nurses at each clinic remained constantly on the premises to receive mothers who brought their babies in. The other nurse was occupied in visiting. Each day the clinic obtained from the district registrar a list of the births in the district, and these were all visited. In cases in which the mother was under medical care, no further action was undertaken unless the child was later on brought by its mother to the clinic voluntarily.

The first baby clinic was opened at Alexandria—a very congested industrial suburb. This was followed by others at Newtown, Wollomooloo, Balmain, North Sydney, Glebe and Newcastle. Miss C. M. Burne, who had previously been on my visiting staff, was appointed superintendent of clinics and visited them regularly and reported to the board.

But the question of finance had not apparently been put on a sound footing, and twelve months after the gazettal of the board, at the suggestion of the chairman (Dr. Clubbe) the members of the board resigned in a body on the grounds that they had not sufficient control over the funds, and the board was dissolved.

A new board was gazetted in August, 1915, with the Minister for Public Health, Mr. Black, as president, and Mr. Flowers, the ex-minister, as chairman. The other members included Mr. G. H. S. King (the Under Secretary), Dr. E. Ludowici and myself, and three ladies, two of whom, Mrs. Dickie and Miss Friend, had been on the former board, while Mrs. Black was the wife of the Minister. I had been sent for by the Minister and asked to take a seat on the board, and had consented to do so. My reasons for accepting a seat on the board were, in brief, that I was deeply interested in infant welfare work and that I thought the clinics could do excellent service in the prevention of infantile deaths, even if somewhat hampered as regards funds, and that as the good results accruing from their operation became more and more evident any reluctance to supply funds for their reasonable expansion would gradually disappear. Subsequent results showed that in future years the Government was not illiberal in supplying funds for the maintenance and extension of the clinics whenever expenditure was declared by the board to be necessary, and in all questions of discipline, method and other internal routine, the advice of the board was implicitly respected, and its decisions were given effect. A nurse inspector (Miss Lucy Spencer) was appointed, whose duty it was to visit each clinic regularly, to keep herself fully in touch with the

conditions prevailing in all the clinics and to report regularly and fully to each meeting of the board. Moreover, the board and individual members thereof, particularly the medical members, paid frequent personal visits to the different clinics from time to time and inspected them. The board advised the Minister as to the necessity for opening new clinics, the appointment of nurses *et cetera*, and on any other subject which it deemed desirable.

In October, 1915, the board was affiliated with the National Council of Women.

The Baby Clinic Board as constituted continued to operate for four years, working during that time under four successive Ministers of Health and increasing its usefulness and the number of its clinics steadily. When the board was constituted in 1915 there were nine clinics in existence, all of which were in the metropolitan and Newcastle districts. Outside those districts the first clinic to be established in New South Wales was at Broken Hill on July 1, 1918, and when this year came to an end the number of clinics in the State had increased to twenty-eight.

An important development during the year 1918 was the formation of the Royal Society for the Welfare of Mothers and Babies, the aim of which was the coordination of the efforts of the different associations and bodies occupied or interested in furthering the welfare of mothers and babies. The New South Wales Government sponsored the society and undertook to assist it financially as occasion arose, though much was hoped from public subscriptions. The Honorable S. R. Innes Naird, M.L.C., was nominated as president of the society, and a "baby week" and lecture tours were instituted. In fact, an active publicity campaign was undertaken and several pamphlets bearing upon the aims of the society were issued. In 1919 the members of the Baby Clinics Board joined the council of the society and were constituted a committee to which the management of the baby clinics was entrusted. The personnel of this committee was strengthened by the addition to their number of Dr. C. P. B. Clubbe, Dr. W. F. Litchfield and Dr. Margaret Harper, all of whom, particularly the last named, rendered most valuable services to the infant welfare movement. The number of baby clinics in the State had now increased to thirty, and the next step was to provide a post-graduate training school for nurses who desired to specialize in mothercraft, and a home where babies suffering from feeding difficulties could be treated. Before this action was taken it was decided to obtain a report upon the working of the Karitane Hospital at Dunedin, New Zealand, and Dr. Margaret Harper was commissioned to visit this institution and to report upon its value as a training school. Dr. Harper reported that although "realizing that the problem which confronts us in New South Wales was one much more difficult of solution than that in New Zealand, there are certain of the New Zealand methods which can be applied here as successfully as they are there". In the result, the society with

Government aid purchased a house with a good garden at Petersham, in the western suburbs of Sydney, and established there the first Tresillian Mothercraft Training Home. Dr. Margaret Harper was appointed medical director, and an Australian trained nurse who had passed through a period of training at the Karitane Hospital at Dunedin, New Zealand, was installed as matron. This latter appointment was not a success, nor was that of a subsequent matron who had a similar training. The third matron, however, who received her training at "Tresillian" itself, proved very satisfactory.

Under Dr. Harper's supervision the existence of "Tresillian" was quickly justified. It was in fact a post-graduate training school for nurses who desired to specialize in mothercraft, and a home where difficult feeding cases could be dealt with and efforts made to reestablish breast feeding when this had been allowed to fail or partially to fail. Nurses came for training from Victoria, South Australia, Queensland, Tasmania and Western Australia. Nurses from New South Wales came in a goodly number from all parts of the State. Mothers and babies also from all parts of New South Wales came to the institution to receive treatment and advice. All the baby clinic nurses were required to receive a course of training at "Tresillian".

After the establishment of "Tresillian" the baby clinics or "baby health centres" as they are now began to be called, increased steadily in number, both in the metropolitan area and in the country districts throughout the State, and their work continued to be more and more appreciated. In 1924, owing to my retirement from the position of Director-General of Public Health and my departure for Europe on a long holiday, I resigned my seat on the committee of the baby health centres, and two years afterwards the whole of the baby health centres were transferred to the direct control of the Director-General of Public Health and the Baby Health Centres Committee ceased to exist. At the time of the change there were already sixty baby health centres in existence in New South Wales.

The Tresillian Mothercraft Training Home proved so successful that a second home was established at Willoughby in the northern suburbs of Sydney in 1927, and a third at Vacluse in the eastern suburbs in 1937, by the conversion of the Lady Edeline Hospital for Babies into a mothercraft training home.

Every nurse in the New South Wales baby health centres, and some hundreds of other nurses, have been trained at one or other of these three homes. To each of the homes Dr. Margaret Harper has acted as honorary medical director since its inception, and to them all she has given unremitting care and highly skilled attention.

In the nineteen years which have passed since the establishment of the first of these homes 5,929 babies and 4,393 mothers have been treated in them, while 950 trained nurses have obtained certificates. Mothers with their babies are admitted to them when difficulty in natural feeding is experienced,

and receive skilled help and training. Those who cannot afford to pay are admitted free of charge. Babies are also admitted without their mothers in special circumstances. At "Tresillian North" and "Tresillian Vacluse" there are special wards for premature babies.

In New South Wales today there are 201 infant welfare centres. Of these there are 53 in the metropolitan area and 148 in the country towns of the State.

An examination of the efficacy of the specialized measures employed to combat infantile deaths is interesting. A pronounced and sudden fall in the infant mortality rate of the State of New South Wales was exactly coincident with the inception of the Town Hall campaign, and the fall was almost entirely due to a reduction in the mortality rate from diarrhoeal diseases. The infant mortality rate of New South Wales, which in 1903 had been 110 per 1,000 births, fell to 82 in 1904 (a fall of 25%). Nor was there any subsequent retrogression from that sudden movement. On the contrary, the rate has continued to fall steadily year by year until the present time. During the eleven years of the Town Hall campaign of health visiting it fell from 110 to 69, or 37%, while during the twenty-four subsequent years of the baby clinics it fell from 69 per 1,000 births in 1914 to 39 per 1,000 in 1938, or 40%. But the specialized campaign was certainly not the sole cause of the improvement, though it must have been an important factor therein.

A study of Table II will clear up some uncertainties. It was constructed from figures kindly supplied by the New South Wales Government Statistician. It shows the infant mortality rates of (i) Sydney (metropolitan), (ii) the remainder of New South Wales ("the country", as I shall call it later on), (iii) New South Wales, (iv) Australia, and (v) New Zealand; and it covers the period from 1871 to 1938. In order to facilitate comparison and to eliminate accidental and unimportant variations, the rates shown are the means of five-year periods. The reason for the inclusion of New Zealand in the table will appear later.

TABLE II.
Deaths of Children Aged Under One Year, per Thousand Births.

Years.	Sydney.	Remainder of New South Wales.	All New South Wales.	Australia.	New Zealand.
1871 to 1875	157	83	108	118	110
1876 to 1880	169	92	114	121	95
1881 to 1885	174	98	123	125	90
1886 to 1890	154	92	114	119	84
1891 to 1895	138	90	111	108	87
1896 to 1900	130	105	113	112	80
1901 to 1905	106	91	97	97	74
1906 to 1910	85	73	77	77	69
1911 to 1915	73	70	71	70	58
1916 to 1920	68	62	65	64	48
1921 to 1925	59	57	58	57	42
1926 to 1930	54	54	54	51	36
1931 to 1935	40	43	41	41	31
1936 to 1938	39	43	41	39	32

The first point to rivet attention in the table is the great discrepancy in the earlier years between

the rates for Sydney and those for "the country", and the fact that though the country rates show no progressive tendency in either direction and practically no variation for the whole thirty-five years preceding the Town Hall campaign, immediately after the year 1903 they begin to show a steadily progressive downward tendency which continues until today. The Sydney rates, on the other hand, which in the earlier years were nearly double the country rates, began to fall after the 1881-1885 quinquennium and continued to fall steadily until 1903, by which time they had fallen by 26%. After 1903 the fall increased in rapidity, and between that year and 1938 the rate had fallen another 66%. By the 1926-1930 quinquennium the Sydney rate had become as low as, and ever since has been lower than, the country rate.

The coincidence between the beginning of the Town Hall campaign and the sudden fall in infant mortality in Sydney suggested that the sequence of events had been simply one of cause and effect; but such a conclusion was shaken by the fact that the country districts of New South Wales and every State in the mainland of Australia participated in an almost exactly similar fall in the same year, although none of them began special campaigns till a few years later. That sudden fall was, however, the beginning of a period of steady decrease in the infant mortality rate of all the Australian States, an improvement which has been most pronounced in South Australia, where the late Dr. Thomas Borthwick, medical officer of health to the city of Adelaide, began an infant welfare campaign in 1907 on very similar lines to those of the Sydney Town Hall campaign. Later on all the other Australian States participated in organized action against infant mortality, and with a measure of success which is indicated in Table II.

The much higher infant mortality rates of Sydney compared with those of the country in the earlier years shown in the table were due, no doubt, to the extraordinarily rapid urbanization of Sydney which was taking place in those years, to the absence of almost any sanitary control either central or local, to bad housing, an inferior milk supply, bad sewerage, innumerable filthy cesspits, inferior drinking water, and to an increase in the practice of feeding infants artificially instead of at the human breast.

From 1885 onwards a steady improvement was taking place under all of these headings. The present excellent system of sewers began to be installed in Sydney in 1880 and was pushed forward actively throughout the succeeding twenty years. In November, 1886, the first of the new Prospect water supply became available to the citizens of Sydney, who had previously depended upon the Botany swamps for their drinking water. Dr. Ashburton Thompson's *Dairies Supervision Act* came into force in 1886, with its resulting striking improvement in the milk supply of the metropolis. The act applied only to the metropolitan police district on its first enactment, and was gradually

extended to other parts of New South Wales later by piecemeal proclamation. The period was undoubtedly Thompson's. He was the first trained sanitarian Australia had known, and his great energy and sagacity dominated the action of the New South Wales Board of Health and fostered one sanitary reform after another.

At or about the beginning of the new century a fresh set of circumstances all strongly in favour of improved sanitation came into existence. Ashburton Thompson's *Public Health Act* became law in 1896, and between that year and 1900 there was a great expansion in the New South Wales Department of Public Health. Medical officers of health were appointed to the most populous districts of the State and highly trained sanitary inspectors began to be employed municipally. Bubonic plague invaded Australia just at the beginning of the century, and its dreaded advent caused such a stirring in the dry bones of civic sanitation as had never previously been experienced. This was true of all the Australian States, even of those two which actually escaped the visitation of plague, and it probably had a great deal to do with the suddenness of the manner in which the great decline in the infant mortality rate first showed itself.

Finally, one must not overlook the great wave of social betterment which spread over Australia after federation, and which expressed itself in rising wages and industrial expansion with greatly improved conditions of living. Such a development reacted powerfully upon the health of the Australian nation, and, as ever, the infant mortality rate was the first statistical response to the change.

As evidence of the value of breast feeding in preventing infant mortality (if any such is necessary), it may be stated here that as a result of investigations covering several years in Sydney, I found that among infants under three months of age the mortality from diarrhoeal diseases was between ten and fifteen times as great among artificially fed children as among those entirely fed at the breast. Newsholme gives very similar figures for England.

Sir Robert Hutchison considers that smaller families, the replacement of the horse by the motor car and the invention of dried milk have probably had as much to do with the spectacular fall of infant mortality in cities as the work of infant welfare centres. I feel sure that the first two of these factors have had an influence which is by no means negligible; but my experience in Sydney during the infant welfare campaign was that dried milk was hardly used at all.

That the specialized campaigns in all the Australian States played a considerable part in the lessening of infant mortality will not and cannot be denied. The experience of other countries, France and England in particular, where as in Australia a similar decrease in infant mortality followed closely upon the adoption of special measures, strongly supports this contention. The improvement in the mortality rate in the country

districts of New South Wales is also significant. This is shown to have begun only after the beginning of the specialized campaign, with its accompanying nation-wide propaganda in both the medical and lay Press in favour of the breast feeding of infants and the inculcation of sound mothercraft, even although direct administrative action was confined to the city of Sydney at first. There was a rather strong revulsion against the artificial feeding of young babies observed in the country districts of the State as well as in the city during the early years of this century, and it was very wisely and firmly fostered by the medical profession.

It is interesting to note that in New Zealand the alteration in infant mortality rates differed in certain respects from that experienced in New South Wales. In New Zealand the specialized campaign against infant mortality did not begin until 1907; but for thirty-five years before that date the infant mortality of New Zealand had been (owing no doubt chiefly to the social, climatic and geographical conditions) the lowest in the world and the envy of every civilized country. It had been falling continuously ever since 1871 (see Table II) though the rate of the fall was no doubt quickened by the Truby King special campaign; and whereas during the thirty-five years between 1871 and 1905 it fell 33%, during the thirty-three years between 1905 and 1938 it fell 53%. New Zealand is still in advance of New South Wales in the race for the reduction of baby mortality, though it has been beaten by South Australia during the last three years. It must, however, be remembered that the island climate and social conditions of New Zealand, with its frequent rainfall, more equable temperature and smaller cities, are more favourable to infant life than those of Australia, with its long droughts, hot summers and overgrown cities, and its isolated and lonely settlements in the wilderness; and the task of reducing infant mortality in Australia was more formidable than it was in New Zealand. It was, however, not impossible. The infant mortality rate for the whole of Australia has fallen 63% between the years 1903 and 1938, while the fall in New Zealand has been distinctly less than that.

SIGMUND FREUD (1856-1939).¹

By W. S. DAWSON, M.D.,
Professor of Psychiatry, University of Sydney.

AFTER exceptional success at school Freud entered the University of Vienna at the age of seventeen. He has placed it on record that an essay by Goethe on "Nature", which he heard read at a lecture, inclined him towards the study of medicine. But at once he encountered race prejudice, for: "I found that I was expected to feel myself inferior and an alien because I was a Jew." Early too, and no doubt in part as a reaction to this prejudice, he developed

¹ Contributed by special request of the Editor.

the attitude of an intellectual rebel. The words which Goethe put into the mouth of Mephistopheles (*Faust*, Part I) made a special appeal to him: "Vain is the mere survey of science: every man can learn only what he can learn."

His entry into the laboratory of the physiologist Ernst Brücke in 1876 marks the beginning of an epoch in Freud's life.

The Neurologist.

The results of Freud's first researches were presented to the Vienna Academy of Sciences on January 4, 1877, a study of the spinal cord and ganglia of *Petromyzon* (lamprey). Later in the same year Freud published a paper, "Observations on the So-Called Testicles of the Eel". Further work on the nervous systems of *Petromyzon* was presented in 1879, and in 1881 Freud read a paper on the nervous system of the fresh-water crab, and also attained his doctorate of medicine. Financial considerations then drove him to clinical work, and in 1882 he became a resident at the principal hospital in Vienna, where for a time he worked under Meynert and engaged in studies on the human nervous system. In 1884 he described a modification of a method of gold impregnation of nervous tissues, in a German publication and also in *Brain* (April, 1884). During 1884-1886 there appeared also papers on "Cerebral Haemorrhage in Scurvy with Localizing Basal Lesions", muscle atrophy with sense dissociation, acute multiple neuritis and a study on the acoustic nucleus and the interolivary tract in the foetal medulla. Meynert offered to hand over his lecturing to Freud, but the offer was declined "in alarm at the magnitude of the task". Moreover, laboratory studies provided no livelihood. Freud made use of his appointment as a junior physician to study clinical neurology, which had not yet become a specialty. He achieved some note as the first in Vienna to make a diagnosis of acute polyneuritis, which was confirmed at autopsy. But his reputation suffered when he presented a neurotic with persistent head pains as a case of chronic circumscribed meningitis. "I understood nothing about neuroses." He adds: "This happened at a time when greater authorities than myself in Vienna were in the habit of diagnosing neurasthenia as cerebral tumour." Despite Freud and Cushing, both so newly joined in death, how hardly is truth still to be attained! In 1886 there appeared also a paper by Freud and Darkschewitsch containing a critical discussion of earlier work on the inferior cerebellar peduncle, together with evidence in support of Edinger's description of tracts between the *nuclei gracilis* and *cuneatus* and the cerebellum.

In 1884 Freud had become interested in cocaine and had carried out some experiments with samples supplied by the firm of Merck. He published a booklet of 25 pages containing the history of the discovery of the coca plant and its use, and referred to a personal experience of the numbing effect of a solution of cocaine on the mucous membranes of the mouth, hinting that a wider use might be found for the drug. He suggested to an ophthalmologist

friend that cocaine might be applied to the eye, and another friend, Koller, carried out experiments on animals and in due course reported at a congress in Heidelberg the production of anaesthesia in the eye by cocaine. A long overdue visit to his *fiancée* had interrupted Freud's researches on cocaine and perhaps robbed him of a great discovery. But "I bore my *fiancée* no grudge for her interruption of my work". After all, four years earlier, soon after he had met his future wife, Freud had published a translation of John Stuart Mill's "Emancipation of Women". In 1885 he was appointed a lecturer in neuropathology and was also awarded a travelling fellowship, which enabled him to proceed to Paris, where the course of his life's work was set. But he did not abandon organic neurology for some years to come.

In 1889 there appeared a paper on hemianopsia in early childhood, and in 1891 a monograph of 107 pages on aphasia, which has been almost completely overlooked by subsequent writers on this subject, even by Head, although Freud accepted the then novel ideas of dissolution of function so recently propounded by Hughlings Jackson. He stressed the importance of the cerebral cortex for speech, but discounted the idea of centres. Freud's most enduring contributions to neurology are his studies on cerebral diplegia, published first as a monograph of 120 pages together with Oskar Rie in 1891, and then in 1893 in his own book of 168 pages, "*Zur Kenntnis der zerebralen Diplegien des Kindesalters*", in which he referred to Little's disease as only one of four varieties of cerebral diplegia, the others being spastic spinal palsy, bilateral spastic hemiplegia, and generalized congenital chorea and athetosis. His observations were based on 53 cases. This work led to an invitation to contribute to Nothnagel's *Handbuch* an article on infantile cerebral palsies (327 pages), which appeared in 1897, and at the head of which Freud is described as *Privatdozent* of the University of Vienna. His last neurological paper, "On Familial Varieties of Cerebral Diplegia", had appeared in 1893.

The Psychologist.

Towards the end of 1885 Freud proceeded to Paris, where he attended Charcot's clinic at the Salpêtrière and earned the great neurologist's gratitude by undertaking to translate his lectures, the German edition of which was published in 1886. The performances of Charcot's "circus", and more especially the occurrence of hysteria in men and the production under hypnosis of conditions which resembled in detail "naturally" acquired hysteria, all tended to confirm in Freud's mind the conception of the mental origin of hysteria at a time when a physical basis was being sought by the majority of physicians. Charcot himself emphasized the *idée fixe* as the origin of hysterical paralysis and anaesthesia.

On his return to Vienna in 1886 Freud married and began practice as a specialist in nervous diseases. He gave an account to a medical society of his experience in Paris, but his references to hysteria in men and to the phenomena induced under

hypnosis were received with scepticism if not with derision. "I found myself", wrote Freud, "faced with the Opposition. As I was soon afterwards excluded from the laboratory of cerebral anatomy and for a whole session had nowhere to deliver my lectures, I withdrew from academic life and ceased to attend the learned societies." Neurotics came to him for help, and his mind was already unalterably inclined towards psychopathology, although his outstanding work on paralyses in children still awaited completion. For a while Freud relied on hypnosis as his main therapeutic agent. After a year or two he began to experience difficulties with his technique, and the rising fame of the Nancy school prompted him to spend some weeks under Liébault and Bernheim in 1889. Again Freud translated the work of his teacher, this time Bernheim. On his return from Nancy, Freud began to attempt the recall of memories under hypnosis in hysteria, a method of which Joseph Breuer, a Viennese colleague, had informed him some years before. In 1893 there appeared the paper by Breuer and Freud, "*Ueber den psychischen Mechanismus hysterischer Phänomene*", containing a description of the cathartic method of the recall of repressed memories with a display of emotion (abreaction). The two workers continued to collaborate for another two years and published their monograph "*Studien über Hysterie*" in 1895. In the same year Freud published a paper in which he separated the anxiety neurosis from the general group of neurasthenia and in fact suggested that anxiety was the root of all neurosis. He named as factors sex perversions and frustrations. In general his experience was teaching him that "it was not any kind of emotional excitation that was in action behind the phenomena of the neurosis, but habitually one of a sexual nature, whether it was a current sexual conflict or the effect of earlier sexual experiences". This was too much for Breuer, who parted company and confined his practice to organic neurology.

A little later Freud abandoned hypnosis for a process of urging and encouraging the patient to bring forgotten facts into consciousness, and the method of psychoanalysis was evolved. It is interesting to note that while Freud admitted the use of suggestion (or transference), he maintained that in analysis "it is not allowed to play the decisive part in determining the therapeutic results". Then followed the conception of the dynamic quality of dreams (the disguised fulfilments of repressed wishes), expounded in "*Die Traumdeutung*" in 1900. "*Zur Psychopathologie des Alltagslebens*" appeared in the following year. Meanwhile Freud was formulating his ideas about the development of the sexual functions, the role of the Oedipus complex, the attainment of normal sexual expression (genital primacy) through the auto-erotic and auto-sadistic stages, and the fixations or arrests of development which he suggested as the basis for neurosis. These extensions of psychoanalytic theory were published in 1905 in the "*Drei Abhandlungen zur Sexualtheorie*". The clinical application of his theories was reported in numerous papers, which

were subsequently collected into several volumes. In 1909 Freud gave a series of lectures at Clark University, Worcester, Massachusetts, and received the degree of LL.D. He wrote: "My short visit to the new world encouraged my self-respect in every way. In Europe I felt as though I were despised."

For some years after Breuer and he had parted company Freud worked alone. Then, about 1903, a small circle of interested workers began to meet regularly, who later resolved themselves into the Viennese Psycho-Analytical Society. An international congress met in Salzburg in 1910, and thereafter psychoanalytic doctrine spread more widely. Two of Freud's outstanding followers left him a few years later, both in disagreement with the Freudian emphasis on sex. Carl Jung developed his own theories of *libido* and the unconscious and its relation to race psychology, while Alfred Adler worked out the self-assertive tendencies and the symptomatology of the failure to achieve adequate self-expression.

In 1912, "the very climax of my psychoanalytical work", there appeared "*Totem und Tabu*", a study of the origins of religion and morality, based on a correlation between material derived from the psychoanalysis of patients and the observations of anthropologists, more especially of Sir James Fraser ("The Golden Bough"). For some years Freud had been working on the relationship between obsessive symptoms and religious ritual and had described the obsessional neurosis as "a private religion and religion as a kind of universal obsessional neurosis". According to Freud, the totem feast commemorates the killing of the primitive father (Oedipus complex), "a fearful deed from which sprang man's sense of guilt (or 'original sin') and which was the beginning at once of social organisation, of religion and of ethical restrictions". Associated reactions to this early sense of guilt are the horror of incest and the institution of exogamy. Other outstanding contributions of Freud towards the elucidation of wider social problems are "*Die Zukunft einer Illusion*" ("The Future of an Illusion"), 1928, and "*Das Unbehagen der Kultur*" ("Civilization and its Discontents"), 1931, in which are worked out the social implications of the individual unconscious. Only by self-deception can the individual accept the necessity for subjection of the (instinctive) self to the demands and prohibitions of society. What we term conscience and ethics are the officials appointed by society to control the individual. Art, music, literature, culture in general are sublimations which enable the individual to disguise intolerable reality. While much of Freud's later work might be said to display decided philosophical trends, he stated as recently as 1932: "Psycho-analysis is not, in my opinion, in a position to create a *Weltanschauung* of its own."

Two other works must be mentioned. The first edition of Freud's lectures appeared in 1918, the last in 1933. In "*Das Ich und Das Es*" (1923) the ego is described as the component of mind which is modified by environment and is concerned with self-preservation, while the super-ego is conscience,

inhibiting instinct in accordance with the dictates of society. The id (*es*) is the reservoir of the instincts, which in later writings were divided into two primary trends, *eros*, manifested through *libido* and striving for the preservation of self and species, and *thanatos*, destructive and overwhelming the individual whenever the gratification of self ("the pleasure principle") must be subjected to grim reality. This is as far as Freud went towards reducing the mind to its functional elements with some reference to their spatial relationship, but "without reference, of course, to the actual anatomy of the brain".

The times were ripe for the jettisoning of outworn and sterile "faculty" psychology, at any rate as far as clinical application was concerned, and it is hardly to be wondered at that in the uncertainty of our knowledge and conceptions of "mind" psycho-analysis has made a wide appeal. The Freudian concept of the unconscious has yet to prove its pragmatic value. It has been said that the unconscious is an invention rather than a discovery. It is after all but a concept, a way of looking at and perhaps explaining certain phenomena, which will remain valid only so long as it proves useful. Freud has called his work on the unconscious the third outrage against mankind's self-love. First Copernicus relegated the earth to a minor position in the universe, then Darwin showed that man is of closer affinity to the animals than to the angels, while Freud has dethroned reason and set up instinct in its stead. "By thus emphasising the unconscious in mental life we have called forth all the malevolence in humanity in opposition to psycho-analysis." Nevertheless "we psycho-analysts were neither the first nor the only ones to propose to mankind that they should look inward, but it appeared to be our lot to advocate it most insistently and to support it by empirical evidence which touches every man closely".

In spite of the self-imposed intellectual isolation of the Freudian school and a training which is so admirably designed to make the minds of its pupils less receptive to contrary teaching, it can never be said that the claims of Freud himself have been excessive or his viewpoint narrowly psychological. In his lectures he named three factors in the production of neurosis: (a) hereditary disposition, "a fixed datum in our [therapeutic] problem which sets a limit to our efforts"; (b) the experiences of early childhood; and (c) frustration, the absence of love in human relationships. Freud's "pansexuality", which aroused derision if not disgust in earlier years, has become greatly modified in the light of later work. The reputation of psychoanalysis has suffered not a little through the prurient minds of amateur and self-taught practitioners who pandered to a popular craze in the immediate post-war period. Even during his American visit in 1909 Freud expressed his fears that his teachings might fall on too receptive and too little discriminative and understanding minds. Much criticism has been levelled against things that Freud has never taught.

"The advice to 'live freely' is out of the question." If Freud had said gently "'Tis Love that makes the world go round", few would have paid any attention to him. Freud never taught that "repression" should be treated by licence in morals or indiscipline in education. Wisely, no doubt, he chose to explore new fields with a mind unfettered by past and current teaching. Yet he wrote: "The edifice of psycho-analytical doctrine which we have erected is in reality but a superstructure, which will have to be set on its organic foundation at some time or other; but this foundation is still unknown to us." In his article in the thirteenth edition of the "Encyclopædia Britannica" Freud suggested that "the future will probably attribute far greater importance to psycho-analysis as the science of the unconscious than as a therapeutic procedure".

In spite of a certain tone of disappointment; if not of bitterness, in his references to his early academic career, Freud did not lack recognition by academic bodies. From the grade of *Privatdozent* he proceeded to the dignity of professor of neurology *extraordinarius* in 1902 and professor *ordinarius* in 1920, retaining the title until 1938. In 1936 he received the honour of foreign membership of the Royal Society of London. His health had declined since 1923, when he underwent a severe operation, and he lived thereafter in the shadow of a possible recurrence of his malady. In 1938 he was expelled from Austria under the new régime, taking with him his collection of Greek and Egyptian pottery, but leaving the contents of his publishing house to be destroyed by the invaders. His teachings had never found acceptance in Germany, where the Kraepelinian system dominates psychiatry. His rejection had led him to refer to "their conscienceless contempt of logic" and "the coarseness and bad taste" of the attacks of his German critics. He added: "Years later, during the Great War, when a chorus of enemies was bringing against the German nation the charge of barbarism, a charge which sums up all that I have written above, it none the less hurt deeply to feel that my own experience would not allow me to contradict it". No doubt Freud had to pay the penalty for that statement. Freud proceeded to England in June last year, the first occasion since he had visited a half-brother in London some sixty years before. He was accompanied by his daughter Anna, the one of his six children most closely associated with his work, for she has written extensively on child analysis.

No doubt Wittel's "Biography", which appeared in 1924, will be supplemented by a more intensive study by one of Freud's followers. Whatever may be the judgement of posterity upon this original observer of human nature, he will surely be remembered as one of the most provocative thinkers of his time.

Bibliography.

- S. E. Jelliffe: "Freud as Neurologist". *Journal of Neurology and Mental Disease*, Volume LXXXV, 1937.
S. Freud: "An Autobiographical Study", 1935. (International Psycho-Analytical Library, Number 26.)

Reviews.

RHEUMATISM IN GENERAL PRACTICE.

THE publication so soon of a third edition of Copeman's "The Treatment of Rheumatism in General Practice" is sufficient indication of the popularity of this excellent little book.¹ Those who were fortunate enough to read the first edition, which appeared in 1933, will not be surprised at its success. Dr. Copeman is a recognized authority on rheumatic diseases, and in passing it is interesting to note that he had accepted an invitation to open the discussion on rheumatism which was to have been the main theme of the sixth session of the Australasian Medical Congress, but which has necessarily been postponed.

The present edition includes all the features that made the original volume so valuable. Many of the chapters have been rewritten and new matter has been added; but the general arrangement of the book, which proved so successful, has been retained. The new edition presents an up-to-date account of the rheumatic diseases, with practical suggestions for treatment, in a form which must appeal to the busy practitioner.

In the earlier chapters clinical aspects and treatment of the various forms of rheumatism are discussed, and in the later chapters special forms of treatment are dealt with in more detail. In this way repetition has been avoided and reference facilitated. A new chapter on focal sepsis has been added, which in a few words states all that is necessary concerning this rather complicated subject. The author wisely remarks: "The wholesale extraction of teeth on empirical grounds is to be condemned. It causes much dyspepsia and dissatisfaction and seldom produces improvement."

Many of the newer forms of treatment are described and critically evaluated, including such methods as "Novocain"-saline injections in fibrositis, epidural injection for sciatica, and the use of gold salts.

This is a book which can be read with pleasure as well as profit, and has only to be known by the practitioner to be appreciated. It is recommended with the fullest confidence.

PHYSICS FOR MEDICAL STUDENTS.

THE second edition of "Physics for Medical Students", by Mr. J. S. Rogers, who has charge of this division of the course in natural philosophy at Melbourne, includes substantial additions to the earlier edition published in 1932.² The mild criticisms which we passed upon that first edition have to be yet further mitigated in virtue of these additions, the well-deserved encomiums correspondingly enhanced. The perusal of this edition certainly confirms our former judgement that this is one of the most valuable books of its kind. Both the selection of the material, with possible minor exceptions to be presently mentioned, and the style of treatment are indisputably excellent.

The writing of this book alone would be sufficient, were other testimony lacking, to stamp Mr. Rogers as a real teacher.

We are particularly pleased to note that certain of the omissions in the first edition to which we drew attention have been made good, notably by chapters dealing with

¹"The Treatment of Rheumatism in General Practice", by W. S. C. Copeman, M.A., M.D., B.Ch., F.R.C.P.; 1939. London: Edward Arnold and Company. Demy 8vo, pp. 284. Price: 10s. 6d. net.

²"Physics for Medical Students: A Supplementary Text Book", by J. S. Rogers, B.A., M.Sc., F.Inst.P., with a foreword by T. H. Laby, F.R.S.; Second Edition, revised and enlarged; 1939. Melbourne: Melbourne University Press, in association with Oxford University Press. Demy 8vo, pp. 318, with illustrations. Price: 12s. 6d. net.

"The Measurement of Body Temperature" and with the "Electro-Cardiograph". In regard to this latter, however, we are surprised to find that a recent type of electrocardiograph, designed and manufactured by an Australian in Australia, although now being made and sold under licence in England and in the United States of America, is apparently not known to the author, although there are approximately a dozen of these machines in use in each of three Australian capital cities. This is a compact, easily operated, direct-writing type of instrument, the light weight and safe portability of which make it ideally suitable for the visiting physician to carry with him on his rounds, so that he can make an immediate bedside diagnosis almost as easily and quickly as he can take the patient's temperature with his clinical thermometer. The trace given by this instrument is finer, even after a forty-fold magnification, than that obtained by instruments employing photographic recording, and it is therefore capable of revealing fine detail which may be lost in the coarser records of a string galvanometer or cathode-ray oscillograph. Its convenience and the excellence and reliability of its performance are abundantly certified by the fact that since it was adopted as the standard cardiograph at the Adelaide Hospital, some six years ago, displacing a much more expensive type of imported machine, which has never since been used, some ten thousand heart traces have been taken with it.

Knowing full well the magnitude of the burden of learning under which the medical student of today has to stagger, we are loath to add another straw to that load. Yet some mention of the stethoscope and a discussion of the physical basis of its utility in diagnosis are surely more important to the practising physician than a knowledge of recent developments in nuclear physics, tremendous though the future consequences of this work may be. And, once again, we express the view that the two introductory chapters, giving a merely chronological account of scientific discoveries throughout the ages, might be omitted. Whatever loss the book might suffer by this omission would be more than compensated if the author would incorporate, along with the descriptive subject matter of each chapter, a brief sketch of the historical development, as in fact he has done in the case of the microscope. In a rather careful reading of the book we have detected no error more serious than such as are due to an occasional slip on the part of the compositor.

The book is worthy not only to be studied by medical students during their course, but to be retained by them for future reference in their library. In fact, every doctor who wishes to understand the *modus operandi* of his scientific tools would be well advised to buy and read it.

Notes on Books, Current Journals and New Appliances.

AN ATLAS OF ANATOMY.

IN the issue of June 12, 1937, we drew attention in these columns to Sections VI and VII of Dr. E. B. Jamieson's "Illustrations of Regional Anatomy". These sections were concerned with the upper and lower limbs respectively. The second edition has now appeared.¹ Coloured plates are more numerous than they were in the first edition; and the author states that some inaccuracies have been corrected. This is an atlas of high standard and (an important point) of convenient size. It should be most useful to all surgically minded practitioners.

¹"Illustrations of Regional Anatomy", by E. B. Jamieson, M.D.; Second Edition; 1939. Section VI: Upper Limb, containing 42 plates; Section VII: Lower Limb, containing 52 plates. Foolscap 4to. Price: Section VI, 7s. 6d. net; Section VII, 10s. net.

The Medical Journal of Australia

SATURDAY, OCTOBER 28, 1939.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

RHEUMATISM IN CHILDREN.

ONE of the most gratifying trends in Australian medicine today is the increasing attention that is being paid to the different manifestations of rheumatism, to its far-reaching and dire effects on the health and efficiency of the people, and to the possible discovery of some means for its prevention. Diseases of the circulatory system are the most potent cause of death in this as in other countries, and rheumatic infection is a cause of much cardiac disease. But the sequelæ of rheumatism are manifest in other systems as well, and it is thus difficult to form an estimate of all its ramifications. In the present state of knowledge—since rheumatic infection cannot be prevented—it is of urgent importance that all sufferers from rheumatic infection should be placed under proper treatment and that their supervision should be continued without intermission until cure is complete or until their condition has become stabilized and no further exacerbation is likely to occur. This statement applies with particular force to acute rheumatism in childhood, and it becomes pertinent to inquire whether everything necessary is being done for affected children.

Reference to this subject has been prompted by arresting statements made in his report for the year ended June 30, 1939, by Dr. Howard Williams, Medical Superintendent of the Children's Hospital, Melbourne. In this hospital the adequate treatment of children suffering from acute rheumatism is hampered by shortage of beds. During the year reviewed by Dr. Williams 141 children suffering from a first attack of the disease were admitted to hospital. Many of these were readmitted later in the year and will, we are told, continue to occupy hospital beds periodically for some years. "At present, and for most of the past year, approximately one-half of the medical beds provided for the older children, at the Carlton Hospital, are occupied by the victims of rheumatic fever." On account of the slow and often tedious convalescence of these children and the pressing need for beds for the treatment of children suffering from more acute diseases many of them have to be discharged with the rheumatic disease unarrested. Only too often, as might be expected, the child has to be readmitted with the disease once more fully active. "This vicious circle continues until either the child dies after a varying number of years of illness spent mostly in bed in a hospital or the disease burns itself out, leaving an invalid entirely dependent on the State and those around him." Dr. Williams points out that, as far as has been possible, the After-care Hospital at East Melbourne has willingly fulfilled a useful function in the provision of temporary accommodation for some of these children. He adds that a considerable proportion of this invalidism could be avoided if a suitable after-care home were established to provide for the convalescence and education of rheumatic children. This state of affairs is not confined to Melbourne. We find on inquiry, for example, that at the Royal Alexandra Hospital for Children, Sydney, there were in 1937, 3,043 medical admissions and that 148 of the patients suffered from acute or chronic rheumatism; in 1937, 91 patients attended the rheumatic out-patient clinic. In this hospital too it sometimes happens that patients have to be sent home before they are really fit to go. The result is, of course, the same as in Melbourne. In Sydney

there is a small (too small) convalescent home to which boys can be sent; there is none for girls.

The information about conditions at the Children's Hospital, Melbourne, is admittedly not complete, but it does show that there is a deficiency that needs to be remedied. The hospital authorities are not responsible for this deficiency. The need is realized, for Dr. Williams writes:

Children who suffer a severe attack of rheumatic fever are crippled no less than those who have some obviously crippling disease, such as a congenital malformation, a tuberculous joint, or infantile paralysis. The care, the education, and the provision for the future of rheumatic children is of equal importance to that of surgical cripples, but as yet no comprehensive plan of action has been formulated.

It is not much use to formulate a comprehensive plan of action if the number of beds is too small and if no adequate provision can be made for the convalescence of the children. We hope that the board of management of the hospital will take this matter in hand and make urgent representations in the right quarters, so that they will be in a position to do what they know needs to be done. In any endeavours that they may make they will surely have the support of Melbourne paediatricians, for, if we can judge by the reports sent to this journal, the Melbourne Paediatric Society is one of the most active medical societies in the Commonwealth.

The subject cannot be left without a word about prevention. Dr. Williams writes that there is good reason to believe that rheumatic fever is essentially related to the state of nutrition of children, and that it must therefore come under the category of a preventable disease. Whether we agree entirely with this statement or not, we shall all agree with him when he adds that if all children were adequately nourished and housed, rheumatism would cease to be the problem that it is today.

Current Comment.

REFERRED PAIN.

SIR THOMAS LEWIS and associated co-workers have been for some time past engaged in researches designed to shed light on the qualitative variations in painful sensation according to the site and nature of the tissue stimulated. They have shown that pain arising from the surface of the body is

qualitatively different from that arising in deeper structures, such as muscle, tendon and fibrous webs or bands, and it would appear from their work on this subject that the difference in painful sensation described by patients suffering from various morbid states can be correlated with the tissue involved if an accurate description is obtained of the exact type of painful sensation evoked. Kellgren has also recently shown that pain arising from ligaments has a definite segmental distribution. This is a good instance of referred pain due to somatic disturbance, and Thomas Lewis and J. H. Kellgren have now amplified the subject by an inquiry into the relation of pain and tenderness derived from deep structures to the segmental areas involved and also the relation that these sensations may bear to visceral disease.¹ They point out that when referred pain is felt in cases of visceral disease muscular rigidity and cutaneous hyperalgesia are well recognized features, and therefore they set out to determine where these phenomena also occur as the result of pain arising from deep structures, such as the interspinous ligaments.

Their experiments were carried out on a number of normal human subjects. The skin and superficial tissues were anaesthetized at an appropriate spot and a needle was then introduced, through which hypertonic saline solution could be injected. The first lumbar ligament was specially chosen because the segmental distribution of the pain produced in this structure strikingly resembles that of renal colic, including pain in the loin and in the inguinal regions. In these experiments contraction of the cremaster muscle was noted corresponding to the appearance of pain, and there was frequently also some accompanying rigidity of the lower part of the abdominal muscles. Superficial tenderness was also observed; and it is interesting to note that the area over which it was felt did not correspond with that of the deep tenderness elicited by pressure on the abdominal muscles. Similar experiments were also carried out, and in these the ninth thoracic, the eighth cervical and the first and second sacral ligaments were used. Similar results were obtained in all these cases, and it will be observed that these are particularly significant, inasmuch as they involve a spread of the objective phenomena into the limbs.

Lewis and Kellgren point out that it is clear that pain may be produced in the human subject by stimulation of a ligamentous structure which is identical in nature with the pain characteristic of visceral disease. By personal experience these workers are aware that the painful sensation produced by injections of hypertonic saline solution into the spinal ligaments has certain very definite characteristics, and in order to determine whether such pain can be qualitatively, that is subjectively, distinguished from pain arising from visceral structures, they have chosen patients who suffer frequently from visceral pain. They have informed these subjects of the nature of the experiments so

¹ *Clinical Science*, Volume IV, Number 1.

that the point at issue should be perfectly clear. For example, a sufferer from angina would be asked if the pain evoked by injection of the left inter-spinous ligament in the region of the seventh cervical spine was truly comparable with the anginal pain with which he was familiar. This practical inquiry was carried out on four subjects; one of them was a doctor who had not only suffered from angina of effort, but was also very interested in the mechanism of its symptoms. In every case the same answer was given, that the pain thus artificially produced was indistinguishable from that of true angina. In a couple of cases there were also some numbness and tingling felt in the left hand and tenderness in the skin in the arm, symptoms which the subjects in question had previously observed during their anginal attacks. It was also found that subjects who had often experienced intestinal colic considered that pain caused by injections of salt solution into the rectus muscle was identical in nature with that of colic. As the result of these observations the authors believe that pain derived from deep somatic structures is not distinct in character from that arising from visceral disturbances. They admit that such a comparison can be subjective only, and therefore they have amplified their observations with purely objective information gained from animal experiments. In this case a specific muscular response was used as the indicator of somatic or visceral stimulation. They used the special technique of the decapitated cat and they found that muscular contractions of the abdominal wall could be produced equally well either by stimulating the spinal muscles or an internal viscus, such as the pancreas. The recorded contractions of the muscles were indistinguishable in each case, and they point out as a matter of interest that the afferent paths are quite different, the first being somatic and the second splanchnic. Further, they found that visceromotor reflexes could not be produced by damage to the bowel itself, but were readily evoked by stimulation of structures, such as the pancreas, lying in the mesentery of the duodenal loop. Injury of the skin readily produced movements of the limbs but not of the abdominal muscles, whereas injury of the lower muscles of the back or of the abdominal wall caused reflex abdominal muscular contractions. They draw conclusions concerning the vascular and motor reflexes from visceral structures, and make some further observations on cutaneous hyperalgesia, which they think is of the same type however it is produced.

For various reasons Lewis and Kellgren believe that the pain nerves of the skin belong to a system quite separate from those which arise in the deeper structures; but perhaps the most interesting part of this work is that concerning the nature of visceral referred pain, as elucidated in the above experiments. They discuss at some length visceral pain, in regard to both its starting point and to the validity of recording it as a separate entity. They do not believe that MacKenzie and others were correct in assuming that pain of visceral origin is

in a category of its own. They are more inclined to follow Morley, who pointed out that referred pain in abdominal disease might be derived not from visceral but from somatic structures, as is well illustrated in the familiar example of pain in the shoulder arising not from an abdominal viscus but from the diaphragm. This view is really of considerable importance. It would seem that visceral pain is not really a sensation *sui generis*, and a realization that identical sensory phenomena may be produced by stimulation of deep but accessible structures should encourage further accurate research work on this subject. We all know the great value to clinical medicine of the contribution made by Head, Campbell and others on the segmental distribution of cutaneous nerves; and if it is possible to map out in a similar fashion the reflection areas corresponding to internal viscera more accurately than has been done hitherto, this and similar work should ultimately prove to be of great practical value.

ASPIRIN AS A CAUSE OF HÆMATEMESIS.

TOWARDS the end of last year A. H. Douthwaite and G. A. M. Lintott made a report on the effect of aspirin on the stomach as seen by the gastro-scope.¹ They gave aspirin to sixteen patients and observed in thirteen of them a positive reaction, which varied from slight hyperæmia to considerable vascular engorgement with submucous hæmorrhage. Three brands of aspirin were tested and not one was found to be devoid of irritant properties. They could find no direct relationship between the development of a reaction and the acidity of the gastric contents, nor between the gastroscopic appearance of the mucosa and its liability to irritation by aspirin. These observations gave some indication of the frequency with which a reaction to aspirin may be expected to occur. A further report by Sir Arthur Hurst and G. A. M. Lintott² is of interest, first of all because it shows how severe the reaction may be, and secondly because the occurrence of hæmorrhage was actually observed with the gastro-scope. The patient was a man, fifty-seven years of age, who was admitted to hospital on account of recurrent hæmatemesis and occasional melena. He had suffered from migraine for thirty-nine years and had been in the habit of taking at least six aspirin tablets a week, and often as many as six in a day. Gastroscopy was performed as soon as two broken aspirin tablets had been swallowed. Zones of hyperæmia were seen to develop around particles of aspirin adhering to the mucosa; two fragments were gripped by the *muscularis mucosæ*. Within a few minutes extravasation of blood occurred. Since the patient has avoided aspirin he has been well. It is important to note that according to the observations of Douthwaite and Lintott calcium acetylsalicylate, probably on account of its solubility, has not such a strongly irritant action as aspirin.

¹ *The Lancet*, November 26, 1938.

² *Guy's Hospital Reports*, April, 1939.

Abstracts from Current Medical Literature.

PHYSIOLOGY.

Hyperparathyroidism Produced by Diet.

EMIL J. BAUMANN AND DAVID B. SPRINSON (*The American Journal of Physiology*, April, 1939) record the production of hyperparathyroidism in rabbits by feeding them on a diet poor in calcium and rich in phosphorus. In the course of some recent experiments they had occasion to change the diet of rabbits from the stock ration of alfalfa, oats and occasional greens to carrots and oats. When, after several months, these rabbits came to autopsy, greatly enlarged parathyroid glands were found; histological examination revealed hypertrophy of the cells and nuclei, with an increase in the amount of lipoids in the cytoplasm. Further experiments confirmed this finding. Investigation of the serum calcium and phosphorus readings showed that these were low, but within the normal range, while the serum phosphatase was possibly less than normal. Apart from increased vascularity, no important changes were found regularly in the bones. The Hamilton and Schwartz test for parathormone invariably gave higher readings than in normal animals. The authors believe that the cause of the parathyroid hypertrophy and the resulting chronic hyperparathyroidism was found to be in the calcium-phosphorus ratio of the diet. The stock diet of alfalfa, oats and occasional greens, on which rabbits will live and reproduce normally, has a calcium-phosphorus ratio of about 4, while this ratio is 0.5 for the carrot and oats ration. When enough calcium carbonate to make this ratio 1 was added to the latter diet, the rabbits fed on it responded to the Hamilton test in the normal way.

Effect of Avitaminosis A on the Human Blood Picture.

O. D. ABBOTT, C. F. AHMANN AND M. R. OVERSTREET (*The American Journal of Physiology*, June, 1939) have made differential leucocyte counts on the blood of individuals whose diets and symptoms indicated a vitamin A deficiency. They observed that mild or latent vitamin deficiencies occur more frequently, and therefore constitute a more serious problem, than fully developed deficiency disease. The subjects making up the experimental groups were college students, women on reducing diets, and rural school children. For various reasons these individuals had been living on restricted diets for periods which varied from a few months to many years. In all of these persons loss of vigour, nervousness and general weakness were the first noticeable symptoms, while the more specific

symptoms included dry hair and skin, brittle nails and eye defects. The changes in the leucocyte counts of 157 individuals were as follows: (i) a mild leucopenia; (ii) a decrease in the polymorphonuclear neutrophile cells; (iii) a relative increase in large lymphocytes, with a corresponding decrease in small lymphocytes; (iv) the occurrence of degenerate cells; and (v) an increase in the number of immature forms. The authors state that this blood picture is similar to that of rats fed a diet deficient in vitamin A, and, as happens with the rats, the administration of large amounts of vitamin A brought about a gradual improvement in symptoms. Concurrently with this improvement the differential count after a few weeks was found to be within normal range. The authors suggest that these changes in the leucocyte count may prove to be useful in the diagnosis of vitamin A deficiency.

Coenzymes.

C. A. BAUMANN AND F. J. STARE (*Physiological Reviews*, July, 1939) define enzymes as heat-labile, non-dialysable, proteinaceous compounds of high molecular weight, which have been produced by living cells and which function as catalysts in specific chemical reactions. Coenzymes, like enzymes, are catalysts produced by the living cells, and are necessary in enzymic reactions; but they are compounds of lower molecular weight, heat-stable and dialysable. The term coenzyme was introduced in 1897 by Bertrand, who applied it to calcium and to manganese salts necessary for the action of certain plant enzymes. In 1904 Harden and Young found that the thermo-stable, dialysable fraction of boiled yeast juice greatly increased the fermentation of cell-free extracts. They termed this active substance the coenzyme of yeast juice. Since the enzyme complex of yeast was called "zymase", the coenzyme of yeast juice came to be called "cozymase". The authors discuss the nature and action of coenzymes, including the pyridine nucleotides, thiamin pyrophosphate, the coenzyme of the d-amino acid oxidase, and adenylic acid, a coenzyme which plays an important role in muscle metabolism. They state that the earlier ideas of the actions of enzymes have been modified. Coenzymes are no longer looked upon as accelerators in any supplementary sense, but rather as essential integral members of a complicated "bucket brigade", transferring hydrogen or phosphate from compound to compound; they empty their buckets and come back for more. But protein enzymes of the traditional type, the dehydrogenases, must be present to bring about the transfer of hydrogen from substrate to coenzyme. The authors emphasize the greatest specificity of the dehydrogenases. They picture the enzyme-coenzyme relationship as follows: "Reaction between coenzyme and substrate takes place

when the proper dehydrogenase, a large molecule, seizes the coenzyme with one hand, the substrate with the other, and bumps the two together." The coenzyme takes hydrogen from the substrate, and the reduced coenzyme breaks away. It can then pass its hydrogen on to a suitable acceptor, either as free reduced coenzyme or in the presence of some other specific protein. The authors observe that the relationship between coenzymes and vitamins is particularly interesting. In both diphosphopyridine nucleotide and triphosphopyridine nucleotide the enzymatically active group is nicotine acid amide, which is also active as a vitamin in the cure of canine black tongue and human pellagra. In cocarboxylase the active group is thiamin or vitamin B₁. In the coenzyme of d-amino acid oxidase the active group contains riboflavin, a member of the vitamin B₂ complex. They point out, also, that all of the coenzymes discussed in this review contain phosphate. The fact that coenzymes are nucleotides is also of importance, since these compounds are characteristic of nucleoproteins and the cell nucleus. This relationship provides an interesting biochemical counterpart of the cytological interpretation of nuclear function.

Relation of Adrenal Cortex to Male Reproductive System.

I. GERSH AND ARTHUR GROLLMAN (*The American Journal of Physiology*, June, 1939) have studied the development of the secondary reproductive organs of male rats and mice in normal, in castrated, and in castrated animals whose adrenal glands had been removed, but who were maintained on adequate doses of cortical hormone. The results of this study show that the transient zones present in the adrenals of mice and rats in which androgenic activity has been assumed to reside, do not exert any demonstrable effect on the development of the male reproductive system. The authors believe that the adrenal gland does not exert any androgenic function in the normal animal. Neither the "juvenile" cells of the adrenal of the rat nor those of the X zone of the mouse exert any androgenic function. Further, the adrenal cortical hormone was found to exert no androgenic effects on the development of the ventral and dorsal prostate glands, of Cowper's gland, or of the seminal vesicles of normal or castrated mice and rats. Extracts of human or pig foetal adrenal glands and of X zone bearing glands of mice were also found to be devoid of androgenic activity. The authors add that these conclusions do not necessarily contradict the explanation of the well-known androgenic effects observed in pathological states. These rare pathological occurrences may be attributed either to the inclusion of embryonic testicular tissue or to a metabolic dysfunction in which some part of the cortex elaborates an androgenic sterol chemically related to the cortical hormone.

In the authors' opinion, both of these mechanisms may be involved in the causation of the adrenogenital syndrome.

BIOLOGICAL CHEMISTRY.

Replacement Therapy in Adrenal Insufficiency.

G. W. THORNE, L. L. ENGEL AND H. EISENBERG (*Bulletin of the Johns Hopkins Hospital*, March, 1939) have found that dogs from which both adrenal glands have been removed, when given a constant diet of low sodium and chloride content, could be maintained in excellent condition by means of subcutaneous implantation of pellets of crystalline desoxy-corticosterone acetate. Removal of the pellets was followed by increased renal excretion of sodium and chloride, weight loss, haemoconcentration, potassium retention and a decrease in the plasma concentration of sodium and chloride. Implantation of the pellets resulted in prompt decrease in the renal excretion of sodium and chloride, increased potassium excretion, restoration of plasma electrolytes to normal, improved appetite and weight gain. The quantity of hormone provided by the pellets was determined by removing and weighing them. A considerable saving in hormone was effected by this method of administration.

Following these successful results, G. W. Thorne, R. Howard, K. Emerson, junior, and W. M. Firor (*ibidem*, May, 1939) employed the same technique in the treatment of six patients with Addison's disease. The beneficial effects were the same as those obtained by daily injection of the hormone in oil, that is, a positive sodium and chloride balance, an increase in the concentration of these ions in the blood plasma, an increased renal excretion of potassium, an increase in plasma volume, a gain in body weight, an increase in blood pressure, and a return to normal activity. As absorption of the pellets was so slow, a supply of hormone sufficient for six to ten months could be provided by implantation of several pellets at one time, with no untoward reaction.

Action of Enterokinase on Trypsinogen.

M. KUNITZ (*Journal of General Physiology*, March, 1939) has shown by experiments conducted under carefully controlled conditions, that the action of enterokinase in converting trypsinogen to trypsin is that of a typical enzyme. The change occurs most readily and completely in the range of pH 5.2 to 6.0 and at a concentration of trypsinogen of not more than 0.1 milligramme per millilitre. The process follows closely the course of a catalytic unimolecular reaction, the rate of formation of trypsin being proportional to the concentration of enterokinase added, and the ultimate amount of trypsin formed being

independent of the concentration of enterokinase. The catalytic action of enterokinase on crystalline trypsinogen in dilute solution at pH more alkaline than 6.0 and in concentrated solution at pH even slightly below 6.0 is complicated by the partial transformation of the trypsinogen into inert protein which can no longer be changed into trypsin even by a large excess of enterokinase.

Excretion of Calcium and Magnesium.

R. A. McCANCE AND E. M. WIDDOWSON (*The Biochemical Journal*, April, 1939) carried out calcium and magnesium balance estimations on six human subjects at two levels of dietary intake (high and low) and during a period of fourteen days, when 0.186 gramme of calcium and 0.219 gramme of magnesium were injected intravenously every day. A comparison of the amounts excreted in faeces and urine during these three periods showed that practically all the extra calcium and magnesium injected was excreted in the urine, while no evidence was obtained that any additional calcium or magnesium was excreted into the gastro-intestinal tract. The authors consider that the gastro-intestinal tract does not function in the regulation of the amounts of calcium and magnesium within the body by the excretion of the excess absorbed.

Plasma Protein Production.

S. C. MADDEN, W. A. NOEHRN, G. S. WARAICH AND G. H. WHIPPLE (*Journal of Experimental Medicine*, May, 1939) have studied the formation of plasma protein in dogs kept under standardized conditions. Blood plasma proteins were depleted by bleeding with return of washed red blood cells, a steady state of hypoproteinaemia and a uniform plasma protein production on a low protein diet being thus produced. Gelatin alone added to the basal diet caused very little, if any, extra plasma protein production. The addition to gelatin of cystine, or tyrosine, or tryptophane, or of both tyrosine and tryptophane had little or no effect on its potency for plasma protein production. When the gelatin was supplemented by cystine and either tyrosine or tryptophane, 25% to 40% of the protein was converted into plasma protein—an efficiency comparable with that of any protein previously tested. Some evidence was presented to indicate that methionine cannot act as a substitute for cystine, nor can phenylalanine act as a substitute for tyrosine in the effect combination of gelatin plus cystine plus tyrosine.

Radio-Active Iron and Its Metabolism in Anaemia.

P. F. HAHN, W. F. BAILE, E. O. LAWRENCE AND G. H. WHIPPLE (*Journal of Experimental Medicine*, May, 1939) have used radio-active iron to investigate the absorption, transportation and utilization of iron in anaemia and in health. Dogs were used for

experimental purposes. To produce anaemia, the dogs were fed on an iron-low diet, and haemoglobin was removed by bleeding. It is shown that the need of the body for iron in some manner determines the absorption of the element, but the mechanism of this discrimination is unknown. Thus in the normal dog with adequate iron stores and no need for absorption, only negligible amounts are absorbed, while the anemic animal absorbs iron quite promptly. The evidence shows that the plasma is the site for transportation of iron from the gastro-intestinal tract to its point of mobilization for the synthesis of haemoglobin. The speed of absorption and of transfer of iron to the red cell is extremely rapid, as the radio-active iron was demonstrated in the red cells in appreciable amounts within a few hours after feeding.

Toxic Action of Coal Tar Antipyretics.

G. BROWNLEE (*Biochemical Journal*, May, 1939) administered acetanilide, phenacetin, phenazone, amidopyrine, aspirin and p-aminophenol to normal healthy rats in daily doses which corresponded to 25% of the average lethal dose. The animals developed a porphyrinuria which in some cases reached values equivalent to twelve times the normal. During the period of dosing the animals lost weight and developed a progressive red cell anaemia. A mild degree of photosensitization was observed in all cases. Equivalent doses of phenacetin and phenazone produced the same degree of porphyrinuria; amidopyrine and aspirin were twice as potent and acetanilide was four times as potent, while p-aminophenol was more potent than acetanilide. A marked degree of red blood cell destruction was observed, with abnormal urobilin output. The urinary porphyrins were identified as coproporphyrin III in each case. The evidence supports the claim that p-aminophenol is the common active degradation product for drugs containing a phenylamine group, and where the amino group is absent, quinol is considered the probable degradation product. It is believed that the oxidation-reduction systems set up by aminophenol or quinol are responsible for the oxidation of haemoglobin to methaemoglobin, and the hypothesis is advanced that where haemoglobin is oxidized to methaemoglobin, the normal conversion into bilirubin cannot occur, but is replaced by degradation to coproporphyrin III.

The Distribution of Bromides and Chlorides in Tissues and Body Fluids.

E. G. WEIR AND A. B. HASTINGS (*The Journal of Biological Chemistry*, August, 1939), after the oral and intravenous injection of sodium bromide, confirm the observations of Wallace and Brodie that bromide replaces chloride uniformly throughout the tissues and fluids of the body, except in the brain and cerebro-spinal fluid.

Special Articles on Civilian War Casualties.

IV.

WAR WOUNDS.¹

EVERY war brings its own problems and its own experience. Those of the South African War were vastly different from those of the Great War, and in the Great War experience in France differed greatly from that in Palestine. Reports from the medical services in the Spanish conflict provide a sample of what we may expect in that upon which we may soon be entering. The advent of the aeroplane and new devices for destruction not only bring war to the civil population, but alter the frequency and the types of wounds and their complications. Once again the influence of the terrain on the nature of injuries and particularly on their attendant infections is emphasized; the dangers of the city differ from those of the open fields, and of cultivated land from those of the veldt or desert.

In many respects we can learn the nature and the solution of the problems of each region only from local experience. There is nevertheless now a very great accumulation of varieties of such experience and knowledge of developments in modern warfare. General principles emerge, and parallel to the advances in the technique of the means of maiming, there have been since the last war great advances in the technique of dealing with the maimed. One need only mention head and chest surgery; the chest is now opened with almost the same freedom as the abdomen. We are better equipped to face many of the war tasks that await us.

Essentially, of course, the injuries of war do not differ from those of civilian life. The extent and frequency of certain kinds of injuries in war concentrate experience well beyond that provided by the motor car. In civilian life only a comparative few in the special departments of great hospitals have much opportunity of judging the results of the procedures adopted. In war, trained first-aid and rescue squads and the organization and extension of those special departments in hospitals (and of special hospitals) become of first rate importance; the urgent experience of a surgeon's normal lifetime may be crowded into a few months.

The modern great bombs used for the destruction of buildings bring down masonry on the occupants and make crushing and other injuries from that cause frequent in cities. Their special features are associated with the determination of the nature and extent of the damage to bone and internal organs, particularly those associated with hæmorrhage, and with the peculiarly severe shock that has been found to attend injuries in such bombing raids. My present purpose is, however, rather to review some of the general features of the injuries resulting from the penetration of tissue by missiles of various kinds. Later lecturers will deal with the peculiarities of injuries in special regions.

The missiles themselves, of course, vary greatly in material and in form and size; they strike at different velocities, and come in every conceivable direction; bacteriologically they may be clean or unclean. Accordingly they vary greatly in the damage they may do. Our concern for the individual, as far as it relates to wounds, will be in the first place with their multiplicity and then in each case with the point of entry, with the direction, depth and extent of the track of disruption and displacement, and with the wounds of exit (if any) and the lodgement of the missile and of any adventitious material brought in with it.

The machine gun or rifle fires a smooth conical bullet of high velocity, which may kill at two miles, and which commonly produces a small hole of entry and a relatively confined track of damaged tissue. At very close range it may produce an explosive effect of much tissue disruption. Damage to the casing of the bullet and imparted rotation from striking some obstruction in its flight may result in fragmentation and lessened penetration; but they may increase the volume of tissue damaged, and fragments and probably portions of clothing may lodge in the wound. Similar destructive results may follow the bullet's impact on bone from the resultant splintering. Apart from such accidents to the bullet, there is some bruising about the track which occasionally produces serious damage to adjacent structures not actually penetrated, for example, the spinal cord. But the serious results arise from damage to important structures, from hæmorrhage, from infection whether from skin, mucous surfaces or introduced foreign matter, and from resultant shock. It is to be noted that machine gun bursts of fire frequently enough result in multiple wounds, that a single bullet may produce many perforations in the intestine and that a wound in the upper part of the thorax or in the buttock may nevertheless penetrate the abdomen.

Shells, bombs, grenades and like projectiles differ from the bullet in that they result in the radiation from the centre of explosion of numerous ragged fragments of various materials of different sizes, so that multiple wounds are the rule. The velocity of the fragments is not so high; but from their form and sometimes their rapid rotation they produce greater destruction of tissue, are more frequently impacted and commonly carry in with them much foreign matter from earth or clothing. In addition to the metal of shell or bomb, stone, masonry and other materials shattered by the force of the explosion provide secondary missiles just as various in size and form and just as effective in causing wounds, and even more dangerous in their secondary effects.

In time past, it was fashionable to wear all one's wounds in front. Nowadays, any prejudice in the matter has disappeared. The determination of the direction a fragment has taken after entering the body may present difficulties, but as has been pointed out in the case of the bullet, it may be of considerable importance. It cannot be assumed that the victim was upright when wounded. The good advice to avoid injury by lying on the face results in an increased frequency of wounds in the back.

Shrapnel and anti-aircraft shells burst in the air and spray the country-side, and until the danger from that source was realized many head and chest injuries, mostly fatal, were suffered by the unwary and unprotected civilian spectators of aerial battles in Spain. Another feature of aerial bombing raids in that country has been the dropping of bombs of different calibres and types. The differences in the injuries they produce are of some interest. The high explosive bomb of several hundred kilograms designed for the destruction of buildings makes a crater fifteen or twenty feet in depth; but the burst is mainly upwards, and though it causes the greatest loss of life, the radius of destruction is limited. People near who have lain flat may merely be shaken by the blast. Scattered sharp fragments of stone, however, produce wounds like shrapnel—comminuted fractures and perforations of intestine. The falling buildings produce many crushing injuries. In these raids it is characteristic that all casualties suffered from severe shock with low blood pressure, a waxy pallor and mental alertness or excitement.

Another bomb of small calibre, designed to burst horizontally on contact with the ground, is so successful in operation that all the wounds in people standing upright are below the waistline.

Yet another of exceptional violence is constructed of metal which breaks into scale-like particles about the size of a finger nail. These produce scarcely noticeable irregular slit-like wounds of entry, but on account apparently of rotation of the scales at high speed, the injury to the underlying tissues is extensive, especially in the case of bone involvement.

¹ A lecture delivered under the auspices of the Melbourne Permanent Post-Graduate Committee on July 24, 1939.

It is a good general principle at any time to suspect small surface wounds over serous cavities of being perforating wounds, but this new weapon makes it the more imperative to make a thorough examination of the wounded with their clothes removed. Since these injuries are almost invariably infected, it is important that they should be found and opened up wherever they occur.

These reports from Spain but emphasize the importance of the well-known characteristics of high explosive shell wounds; their multiplicity (particularly destructive of tendons, vessels and nerves); their ragged character; the disruption, displacement and bruising of tissue; the severing or damaging of vessels and nerves; the shattering of bone; with the consequent production of a volume of dead, non-viable and precariously viable tissue, blood and exudate, and with the sinister admixture of metallic fragments, earth, dirty clothing and other sources of infection.

Now these conditions (in contrast to those produced typically by bullets, which in many cases are best left alone) have proved to be ideal for the development of sepsis, and the preservation of life and function depends in large measure on success in its prevention. Experience continues to confirm the verdict that this success is dependent on the early removal both of all dead and non-viable tissue and of all infected and foreign material. Given measures that preserve a satisfactory blood supply, such a clearance within six hours has a good chance of success; by twelve hours the organisms are beginning to become established, and by twenty-four hours the most that can be hoped for is mitigation. Incidentally, the use of antiseptics for preventing the development of sepsis is condemned.

Though often hemorrhage from tissue torn by irregular fragments may not be so great as might be expected, the loss of blood and fluid from multiple wounds may be very considerable without much local spectacular evidence of flow. Moreover, such multiple injuries (more particularly as has been mentioned already in the circumstances of their infliction) produce severe shock, which is greatly aggravated by such loss. The control of hemorrhage, the prevention of shock and measures against sepsis are the supremely urgent matters for those called on to deal in the first instance with such casualties. Time is all-important. None must be lost in stopping hemorrhages, in relieving pain, in preserving body heat, in securing immobilization and in getting the injured to a place where loss of blood may be made good, and sepsis prevented.

The infections of war wounds are typically mixed, and those of the area in which British troops would probably be fighting in the event of war with Germany and the precautions to be taken against tetanus are well known to us. It is probable that knowledge of the limitations and possibilities of the treatment and prophylaxis of many infections by the use of drugs of the sulphanilamide group would be considerably advanced by experience in any such conflict.

It is impossible in such a short address to deal in any detail with infections; but some of the facts important in treatment regarding the development of gas gangrene may be of interest. The condition is particularly likely to develop in association with injuries to muscle and bone where much dead or non-viable tissue is present, and its development is greatly favoured by any interference with the blood supply, even of such moderate degree as that provided by primary suture in an amputation stump. One important observation from Spain is that severe anaerobic infections were found to be almost invariably accompanied by involvement of bone, so that the occurrence of such a focus of infection in soft parts should lead to a search for a lesion in bone. A massive form occurs when a major vessel fails to maintain blood supply, and without amputation is often rapidly fatal. In a more localized form the death of muscle is confined to one group and resection of the affected muscle is usually sufficient. Striking variability in the toxicity of gas gangrene infections has been observed; a localized abscess with obvious gas may be non-toxic, while another similarly localized infection may cause the development of toxic jaundice and broncho-

pneumonia and the patient may die in a few days. Metastatic abscesses are relatively common in mixed infections; but invasion of the blood stream by gas-producing organisms is rare and usually late. The condition of the affected muscle is quite distinctive; its colour is dark or brick red and it is non-contractile and friable or soft. The presence of gas and tympanitic swelling, a thin discharge and an acetylene smell accompany a yellow skin, dry tongue, low blood pressure and rapid pulse.

There are conflicting and not very satisfying reports of the efficacy of antisera, some observers finding it of no value, others being of the opinion that injection, especially local injection, of French polyvalent serum had some antitoxic effect.¹

P. MACCALLUM, M.C., M.A. (New Zealand), M.Sc. (New Zealand and Melbourne), M.B., Ch.B. (Edinburgh), D.P.H., R.C.P.S. (Glasgow), M.R.C.P. (Edinburgh), Honorary Major, A.A.M.C., Melbourne.

British Medical Association News.

MEDICO-POLITICAL.

ANNUAL MEETING OF THE DELEGATES OF THE AFFILIATED LOCAL ASSOCIATIONS OF MEMBERS WITH THE COUNCIL OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

THE annual meeting of delegates of the local associations affiliated with the New South Wales Branch of the British Medical Association was held at the William H. Crago Council Room, British Medical Association House, 135, Macquarie Street, Sydney, on September 29, 1939, DR. G. M. BARRON, the President, in the chair.

The following delegates of local associations were present: Dr. R. A. Robertson (Border Medical Association), Dr. L. Abramovich (Canterbury-Bankstown Medical Association), Dr. O. J. Ellis (Central Northern Medical Association), Dr. R. O. Williams (Central Southern Medical Association), Dr. G. N. M. Aitkens (Central Western Medical Association), Dr. L. R. Flynn (City Medical Association), Dr. J. H. Leadley (Eastern Suburbs Medical Association), Dr. J. Macarthur (Far South Coast and Tablelands Medical Association), Dr. G. F. L. Elliott (Illawarra Suburbs Medical Association), Dr. W. L. Kirkwood (Kuring-gai District Medical Association), Dr. R. J. Jackson (Northern Districts Medical Association), Dr. J. R. Ryan (North-Eastern Medical Association), Dr. N. F. Benjamin (Southern District Medical Association), Dr. A. L. Caselberg (South-Eastern Medical Association), Dr. C. H. Jaede (South Sydney Medical Association), Dr. R. V. Bretherton (Warringah District Medical Association), Dr. R. D. Mulvey (Western Medical Association), Dr. R. F. Back (Western Suburbs Medical Association).

The following members of the Council of the New South Wales Branch were present: Dr. G. Bell, Sir Charles Blackburn, Dr. A. J. Collins, Dr. A. M. Davidson, Dr. L. A. Dey, Dr. J. Adam Dick (Vice-President), Dr. B. T. Edye, Dr. P. L. Hipsley, Professor W. K. Inglis, Dr. H. H. Jamieson, Dr. K. C. T. Rawle, Dr. W. F. Simmons, Dr. E. H. M. Stephen, Dr. A. C. Thomas, Dr. E. A. Tivey, Dr. R. C. Traill, Dr. A. S. Walker.

The following representatives of sections for the study of special branches of medical knowledge attended during the discussion of war emergency organization: Dr. H. J. Daly (Anaesthesia), Dr. K. B. Noad (Medicine), Dr. G. L. Stening (Obstetrics and Gynaecology), Dr. W. N. Little (Orthopaedics), Dr. D. G. Carruthers (Oto-Rhino-

¹ Specimens from the collection of war wounds in the possession of the Defence Department were demonstrated after the lecture.

Laryngology), Dr. W. P. MacCallum (Pædiatrics), Dr. F. S. Hansman (Pathology and Bacteriology), Dr. L. Cowlishaw (Medical Literature and History).

Dr. J. G. Hunter (Medical Secretary) and Dr. H. Hunter (Assistant Medical Secretary) were present.

The Editor of THE MEDICAL JOURNAL OF AUSTRALIA was represented by Dr. W. L. Calov.

Apologies.

Apologies for non-attendance were received from Dr. K. S. M. Brown and Dr. N. E. McLaren.

Welcome of Delegates.

Dr. G. M. Barron, the President, welcomed the delegates. He stressed the value of the annual meeting of delegates both to the Council and to the great body of members of the New South Wales Branch.

Annual Subscription to the British Medical Association.

Proposal of the British Medical Association in Regard to Overseas Subscriptions.

It was resolved, on the motion of Dr. L. A. Dey, seconded by Dr. E. H. M. Stephen:

That the proposal of the British Medical Association in regard to the overseas subscription be considered.

A resolution carried by the Council on August 29, 1939, was as follows:

(a) That the delegates to the annual [1939] meeting of delegates be informed that the Council is of the opinion that the present subscription, i.e., £1 5s. 6d., to the British Medical Association should be continued and that the annual subscription of the Branch should be increased.

(b) That it be a recommendation to the annual [1939] meeting of delegates that consideration be given to the advisability of providing in the proposed increase of subscription for an amount that would cover the cost of establishing, under the direction of the Council, a department of medical economic research.

Dr. J. G. Hunter, in explanation of the resolution, said that the Federal Council was composed of twelve members (two representatives from each State). It met twice a year. Its income was derived from a *per capita* payment of two shillings from the several Branches. This amounted to £450 a year. The costs of the Federal Council were high. Travelling expenses of members had to be paid. In addition, a living allowance of £1 10s. a day was made to each member during his absence from home to attend meetings of the Federal Council; but no allowance was made for loss of practice. The existing arrangement was that the Medical Secretary of the New South Wales Branch was also the General Secretary of the Federal Council. In the course of his duties the General Secretary had to spend a good deal of time away from the office of the New South Wales Branch. This had necessitated the appointment of an assistant secretary, who was a servant of the Federal Council and who in the absence of the General Secretary acted not only as Secretary of the Federal Council but also of the New South Wales Branch. The income of the Federal Council was so limited that a permanent secretarial appointment could not be considered. It had been suggested that the numbers of representatives on the Federal Council might be reduced; but any such change had been regarded as inadvisable, because, as a general rule, one of the two representatives from any State was a consultant and the other a general practitioner; therefore it was possible for the Federal Council to appreciate the outlook of all sections of the profession. Fortunately the Parent Body had given £1,000 a year for the past three years, and this had been sufficient to tide the Federal Council over those years. Out of every member's annual subscription to the Branch the sum of £1 5s. 6d. went to the Parent Body. The Parent Body

had suggested that only five shillings should be sent. But this suggestion had the drawback that if it were adopted the members of the Branch would no longer be entitled to *The British Medical Journal*. If a member wanted *The British Medical Journal* he would have to pay £1 11s. 6d. sterling (£2) *per annum* for it. Viewed coldly, this was not an attractive business proposition. But the question arose whether members generally wanted *The British Medical Journal* and would accept a proposal that did not include provision for continued supply of *The British Medical Journal*. Another matter that had to be considered was the purely sentimental one of cutting the ties with the Home Association. Dr. Hunter went on to say that if members were not prepared to accept the Parent Body's proposal their subscriptions to the Branch would have to be reviewed. He pointed out that not all members paid £5 5s. *per annum*; the average was £4 17s. Out of this £1 5s. 6d. had to be forwarded to the Parent Body, £1 was paid to the Australasian Medical Publishing Company, Limited, for *THE MEDICAL JOURNAL OF AUSTRALIA*, and 2s. to the Federal Council, and £2 6s. 3d. went to the cost of the secretariat. The balance was 2s. 3d. Dr. Hunter explained how the secretarial costs were made up and then went on to show that as a result of an extra call of 4s. *per member* made by the Federal Council, instead of the theoretical credit balance of 2s. 3d. there would be an actual deficit of 1s. 9d. It might be argued that the large profits from rental of professional rooms in the British Medical Association House should provide ample financial means; but these profits were being employed to pay off a loan on the building and to meet obligations to debenture holders.

Dr. Hunter said that if members of the Association wanted the Federal Council to continue to function, they would have to find some means of financing it. The desirability of a department of medical economic research had been realized for some time; but the Council had realized that it could not meet the cost, which would be approximately £800 to £900 *per annum*.

Proposed Increase of the Annual Branch Subscription.

It was moved by Dr. J. R. Ryan and seconded by Dr. R. J. Jackson:

That it be a recommendation to the Council that the annual subscription of members of the New South Wales Branch should be increased to £6 6s.

Dr. O. J. Ellis said that the majority of the members of his local association were in favour of an increase in the subscription; but they had raised the question of a differential rate for country members. He foreshadowed a motion that if the motion were carried a differential rate should be considered. He pointed out advantages of city membership, including access to the library, ability to attend meetings *et cetera*. He was not prepared to say what the difference in the rate should be; but he expressed the opinion that the subscription payable by country members should be lower than that paid by city members.

Dr. N. F. Benjamin moved, by way of amendment, that the increase should be by 10s. 6d. instead of £1 1s.

The amendment lapsed for want of a seconder.

Dr. R. A. Robertson, Dr. R. V. Bretherton, Dr. R. F. Back, Dr. G. N. M. Aitkens, Dr. R. O. Williams, Dr. R. D. Mulvey and Dr. A. L. Caselberg also took part in the discussion.

The motion was carried.

Proposed Differential Rate for Country Members.

It was moved by Dr. O. J. Ellis, seconded by Dr. G. Bell:

That the Council be asked to consider the provision of a differential rate of subscription for country and city members.

Dr. R. J. Jackson said that he thought the matter should be referred back to the country members for their opinion. He believed that many country members were quite content with the subscription rate.

Dr. E. H. M. Stephen pointed out that as far as attendance at meetings was concerned, the suburban practitioners did not have any great advantage over the country members. Very often they were busy during their evening hours of consultation, and by the time they had finished their work it was too late to go to a meeting.

Dr. G. Bell drew attention to the library service of the Royal Australasian College of Surgeons. If a Fellow of the College wrote inquiring for an article, the original was turned up and a photostat was made of it. This was sent to the inquirer, who kept the photostat in his records. Possibly a similar service could be instituted at the library of the Branch.

Dr. L. A. Dey drew attention to the facilities provided for country members by the visits of lecturers to country centres.

Dr. W. F. Simmons pointed out that during the year Dr. Barron and Dr. Hunter had toured the country at the Association's expense in order to make closer contact with country members. He thought the Association was sailing very close to the wind while the subscription remained as low as £5 5s. *per annum*. One never knew when sudden demands on the funds might arise. In conclusion he mentioned that men did not seem to mind what subscriptions they had to pay to golf clubs *et cetera*, and he thought they should not object to an increase in their subscription to the Branch.

The motion was not carried.

Friendly Society Lodge Practice.

Particulars of Lodge Patients to be Entered in Lodge Books.

It was moved by Dr. C. H. Jaede and seconded by Dr. N. F. Benjamin:

That the united friendly societies be advised to insert in each lodge book the names and dates of birth of those entitled to medical benefits under the Common Form of Agreement.

Dr. Jaede pointed out various advantages of having the names of those entitled to medical benefits entered in the lodge book. He said that the medical officer had no means of checking the ages of lodge members. Furthermore, it was not always a person entitled to benefit who presented himself before the medical officer. It was not an uncommon thing for a lodge member to send the neighbour's child to the medical officer for treatment.

Dr. W. L. Kirkwood expressed the opinion that the procedure would present considerable difficulties to lodge secretaries. The members of the Kuring-gai District Medical Association thought the question was not worth raising at the present time.

Dr. R. F. Back, Dr. R. J. Jackson, Dr. L. Abramovich, Dr. O. J. Ellis, Dr. R. V. Bretherton, Dr. R. A. Robertson, Dr. G. N. M. Aitkens, Dr. A. L. Caselberg, Dr. R. O. Williams and Dr. H. H. Jamieson took part in the discussion.

Dr. Jaede, in reply, said that the procedure would be of assistance to the lodges in that it would prevent some of the abuses that they were subject to. It was the duty of the lodges to put their own house in order. The procedure suggested by him would benefit both the lodges and the profession.

The motion was carried.

Medical Lists.

It was moved by Dr. G. F. L. Elliott and seconded by Dr. R. A. Robertson:

That medical lists be furnished by lodge secretaries, complete with name, initials and addresses of their members on or before January 1 of each year. Such lists shall be held to be the medical list of the lodge until December 31 of that year. No member's name shall be removed from such list during the year, except in case of death, transfer to another list, removal from the district or resignation from the lodge, in which case the

medical officer is to be notified and the reason given. Additions made during the year shall be held to be made until the end of the current year, with the same exceptions as above.

Dr. Robertson pointed out that there was a tendency for a person to have his name placed on a list when he anticipated the necessity for an operation and after three months to allow his entitlement to medical benefits to lapse.

Dr. J. H. Leadley said that the Eastern Suburbs Medical Association did not approve of the proposed change. Less fault was to be found with the actions of members than with the lodge secretaries.

Dr. A. L. Caselberg said that he had been instructed to vote against the motion, but he thought that the members of his local association would not have opposed it if they had known the reasons for it. He suggested that it might be advantageous if delegates could meet some weeks before the annual meeting so that they might exchange views on the matters to be brought up at the annual meeting and then to report back to their local associations.

Dr. W. F. Simmons, Dr. C. H. Jaede, Dr. R. F. Back, Dr. E. H. M. Stephen, Dr. R. J. Jackson, Dr. R. V. Bretherton, Dr. O. J. Ellis, Dr. N. F. Benjamin, Dr. G. N. M. Aitkens and Dr. R. O. Williams took part in the discussion.

The motion was not carried.

Fees for Midwifery.

It was moved by Dr. J. H. Leadley and seconded by Dr. G. F. L. Elliott:

That Section 11 of the Common Form of Agreement be deleted and be replaced by the following: "The medical officer shall, when required, attend the wives of members in their confinements and that the fee for such attendance shall be as per arrangement between the member and the medical officer."

Dr. Leadley said that much more prenatal and post-natal attention was required now than formerly. More was demanded of the medical attendant. Also the type of case had become more difficult. In operations and the treatment of fractures the fees were a matter of arrangement by the medical officer and the patient. He thought the same rule should apply in midwifery. There should be elasticity rather than hard and fast rules.

Dr. J. R. Ryan said that he was opposed to the motion. He thought that it was a good thing to be able to show the patient where a definite fee was laid down. He would agree to an increase in the fees as set out in the Common Form of Agreement. He pointed out that the difference between confinements and such things as fractures was that the latter usually came unexpectedly.

Dr. O. J. Ellis opposed the motion, as it made no provision for a minimum fee.

Dr. A. L. Caselberg expressed the opinion that the introduction of the change proposed by Dr. Leadley would lend itself to unethical practices.

Dr. R. J. Jackson, Dr. G. N. M. Aitkens, Dr. C. H. Jaede and Dr. N. F. Benjamin took part in the discussion.

The motion was not carried.

Income Limit.

It was moved by Dr. L. Abramovich and seconded by Dr. C. H. Jaede:

That effective measures be taken to enforce the income limit clause of the Common Form of Agreement.

Dr. Abramovich quoted instances of abuse of the clause relating to income limit. He mentioned that in the Canterbury-Bankstown district efforts had been made to overcome the difficulties by a system that had been in use by the Illawarra Suburbs Medical Association; but such a system did not prevent a person's applying for medical benefits in some other district. There were no effective

measures of preventing these abuses. Effective measures could be carried out only by a central body.

Dr. N. F. Benjamin said that lodge secretaries should be made to tell members about the clause relating to income benefit; many members of lodges were ignorant of it.

Dr. G. F. Elliott, Dr. R. J. Jackson and Dr. W. F. Simmons also took part in the discussion.

Dr. Abramovich, in reply, pointed out that there was nothing to stop a man from having his name put on the list for medical benefits, even though his income was above the limit. Medical officers were often at fault. They should see that no member became eligible for medical benefits unless his income was within the prescribed limits.

The motion was carried.

Capitation Rate.

It was moved by Dr. L. Abramovich and seconded by Dr. C. H. Jaede:

That the present capitation rate for friendly society members is inadequate.

Dr. Abramovich said that the members of the Canterbury-Bankstown Medical Association thought that it should be recorded that the capitation fee was regarded by the profession as inadequate.

Dr. R. J. Jackson and Dr. W. F. Simmons took part in the discussion.

The motion was carried.

War Emergency Organization.

It was moved by Dr. A. J. Collins, seconded by Dr. L. A. Dey:

That the scheme of the Council for the protection of practices of members of the Association on active service be considered.

The motion was carried.

The model scheme was then considered and discussed by delegates and by members of the Council.²

Financial Arrangements.

It was moved by Dr. N. F. Benjamin and seconded by Dr. R. J. Jackson:

That the financial arrangements for the war emergency organization be left to each individual unit to decide.

Dr. W. L. Kirkwood said that the opinion of the Kuring-gai District Medical Association was that local associations should not have sole control of financial arrangements and that a special committee should be appointed by the Branch.

Dr. C. H. Jaede asked what would happen if one or more members failed to fall in with the scheme.

Dr. G. F. L. Elliott said that if a few members stood out it would not prevent the carrying out of the scheme. Complete unanimity was impossible.

Dr. L. Abramovich said that in one respect conditions were similar everywhere, namely, in regard to lodge practice. The lodge list of any medical man on service should remain unaltered. The lodge members whose names were on his list should be allowed to consult any lodge medical officer in the district, and the fees of such lodge members should be paid into a pool. If this method was employed and if other arrangements broke down there would still be a certain income for the absent medical officer.

Dr. R. D. Mulvey said that an epitome of the Western Medical Association's views was as follows: (1) all fees

owing to a medical practitioner at the time of his departure to be collected; (ii) a pool to be established from the time of his departure and at least two trustees to be appointed to control it; (iii) income to be calculated on a basis of the average for the three years prior to the medical practitioner's departure; (iv) the whole scheme to be under theegis of the British Medical Association; (v) a notice to be placed in each medical practitioner's waiting room to show how the practices of absentees were being safeguarded.

Dr. D. G. Carruthers agreed that the financial arrangements should be left to local units. He also thought that the machinery of the scheme would have to be left largely to local units. He thought it probable that many men leaving on active service would not require assistance from a unit, having made private arrangements. He pointed out difficulties in the way of preventing individual medical practitioners from setting up independent practices. The great numbers graduating in medicine each year had to be absorbed in some way.

Dr. H. H. Jamieson, Dr. O. J. Ellis, Dr. R. V. Bretherton, Dr. R. F. Back and Dr. J. H. Leadley also took part in the discussion.

The motion was carried.

It was resolved, on the motion of Dr. N. F. Benjamin, seconded by Dr. G. F. L. Elliott:

That all clauses dealing with financial arrangements be deleted.

It was resolved, on the motion of Dr. G. N. M. Aitkens, seconded by Dr. R. A. Robertson:

That any financial arrangements that may be made should be submitted to the British Medical Association for ratification before being put into operation.

Commencement of Practice.

It was moved by Dr. R. V. Bretherton and seconded by Dr. J. R. Ryan:

That paragraph 5 of "Notes on the Model Scheme for the Guidance of the Local Emergency Committee" in the "Explanatory Memorandum" should be embodied in the scheme itself.

Dr. J. G. Hunter, Dr. K. C. T. Rawle and Dr. W. F. Simmons took part in the discussion.

The motion was carried.

Form of Agreement.

Dr. J. G. Hunter pointed out the possibility that it might be necessary to alter the form of agreement after further discussion with the Branch's legal advisers.

It was resolved, on the motion of Dr. J. R. Ryan, seconded by Dr. C. H. Jaede:

That power be given to the Council to alter the form of agreement after further legal opinion has been obtained.

Formation of Units.

It was resolved, on the motion of Dr. J. R. Ryan, seconded by Dr. R. F. Back:

That local associations and special groups be requested to form units forthwith and that the local associations be supplied with details acceptable to the Council.

Vote of Thanks.

On the motion of Dr. R. A. Robertson the meeting carried, with acclamation, a vote of thanks to the Medical Secretary, Dr. J. G. Hunter, for the large amount of painstaking work he had carried out in the evolution of this well-conceived scheme.

² The recommendations of the annual meeting of delegates were accepted by the Council. Other amendments were made by the Council and the scheme as now adopted is set out as an addendum to this report.

Proposed Regional Representation on the Branch Council.

It was moved by Dr. J. H. Leadley, seconded by Dr. A. L. Caselberg:

That the Council of the New South Wales Branch of the British Medical Association be elected by regional representation, as obtains in the election of the Lower House of Parliament as opposed to the election of the Senate.

Dr. Leadley said that during the previous twelve months there had been a number of occasions when the Council had had to adjourn movement on various matters until after meetings of local associations. If the local associations were represented on the Council the meetings of the Council would be of greater value than meetings of delegates as at present constituted. Further, there was no reason why local associations should not appoint as their representatives both general practitioners and men engaged in special practice. The motion was not intended merely as a criticism of things as they were; it was constructive in character. The election of a council on the lines suggested would give members of local associations a feeling that they were more directly represented and would give them a more readily accessible channel for the expression of their views. The scheme, if adopted, would prevent the danger of the formation of a general practitioner group, as in another State.

Dr. A. L. Caselberg said that if the proposed method of election was adopted the rank and file in each group would feel that they had a more direct voice in the control of the Branch's affairs. Representatives of local groups could be approached directly by members of groups or local associations.

Dr. R. O. Williams said that he had presented a somewhat similar proposal last year. There should be four general practitioners on the Council, and this should be laid down in the constitution.

Dr. R. F. Back said that he thought that the matter should be referred back to the local associations.

Dr. R. J. Jackson said that the Northern District Medical Association regarded the existing arrangements as satisfactory.

Dr. R. V. Bretherton said that representatives of local associations did not seem to avail themselves very largely of the opportunity to attend the quarterly meetings of the Council. There seemed no reason to believe that their attendance would improve if they were actually members of the Council.

Dr. A. J. Collins said that some years before he had moved that an inquiry should be made of members as to their ideas on the necessity for change. The Medical Politics Committee had reported that there was no great demand for a change. Dr. Collins now thought that it would be of greater value if the importance of the meetings of delegates was enhanced. If the views of these meetings could be recognized as the views of the great body of practitioners there would be no doubt about their acceptance.

Dr. R. A. Robertson said that he felt that often matters for discussion at the annual meeting of delegates were not fully understood by the local associations. It might be advisable to have a preliminary meeting of delegates of local associations some time before the annual meeting.

Dr. W. F. Simmons said that all the difficulties might be overcome if the Council was regarded as an executive body as distinct from a representative body. It would be possible to have a representative body as well as the Branch Council. He stressed that every section of the profession should be represented on the Council; it was not desirable for the Council to become a general practitioner body.

Dr. Leadley, in reply, said that he had attended the quarterly meetings of the Council and he had noted that 99% of the business done related to general practitioners. The enthusiasm of specialists in dealing with this business was in strong contrast to the apathy of the bulk of general practitioners in their own business. If

there was direct representation he thought that the general practitioners would be aroused from their apathy. The motion was not carried.

Mileage Fees in Private Practice.

On the motion of Dr. W. F. Simmons, seconded by Dr. N. F. Benjamin, the matter of mileage fees in private practice, which had been deferred from the 1938 meeting, was discussed.

It was moved by Dr. R. J. Jackson, seconded by Dr. R. D. Mulvey:

That mileage fees remain as at present.

Dr. R. A. Robertson and Dr. N. F. Benjamin took part in the discussion.

The motion was carried.

Workers' Compensation.

Medical Examiner of Insurance Company.

It was moved by Dr. C. H. Jaede, seconded by Dr. W. L. Kirkwood:

(a) That any member who has been appointed as a medical examiner by an employer and/or insurance company under the provisions of the *Workers' Compensation Act, 1926-1929*, or any amendment thereof, shall immediately notify the Branch in writing of such appointment.

(b) No medical examiner so appointed shall treat any injured worker entitled to the benefits of the *Workers' Compensation Act* except: (i) for first aid treatment only; (ii) with the signed consent of the injured worker upon the following form issued by the Branch, namely:

I (name of injured worker) do hereby request Dr. (name of examiner) to treat me for my injury. I am fully aware that, under the *Workers' Compensation Act*, I have the right to choose my own medical attendant for my injury and/or illness arising out of my employment.

Dr. A. L. Caselberg, Dr. J. R. Ryan and Dr. R. F. Back took part in the discussion.

The motion was carried.

Proposed Amendment to the Workers' Compensation Act.

It was moved by Dr. A. L. Caselberg, seconded by Dr. L. Abramovich:

That the Council of the British Medical Association be requested to interview the Government and endeavour to have the *Workers' Compensation Act* amended in such a way that the employer be directly responsible to the medical men for medical fees under the act.

Dr. W. F. Simmons, Dr. R. A. Robertson and Dr. G. F. L. Elliott took part in the discussion.

The motion was carried.

Luncheon.

The Council of the New South Wales Branch of the British Medical Association entertained the delegates at luncheon at the University Club.

Addendum.

Model Scheme for the Protection of Practices of Absentee Medical Practitioners.

- I. AREA: The area of this scheme is that covered by the Shire Municipality of Town
- II. DEFINITIONS:

(a) The term "absentee practitioner" shall mean a practitioner who is engaged on whole-time war service.

(b) The term "acting practitioner" shall mean a practitioner who, not being on whole-time war service, is engaged in practice within the area of the scheme and has signified his assent to the provisions hereinafter set out.

(c) The term "legal representative" shall mean a registered medical practitioner or other person who has been legally appointed by the absentee practitioner to receive moneys, sign documents, and generally to safeguard his interests.

(d) The term "trustees" shall mean the medical practitioners or other persons appointed by the practitioners participating in the scheme and responsible for the financial administration of the scheme.

(e) The word "unit" shall mean the group of practitioners in the area of that part of the State of New South Wales to which this scheme shall apply.

(f) The word "patient" shall be understood to be a person to whom the medical practitioner was the regular or family medical attendant prior to his going on military duty and not a person to whom he has given casual or occasional attendance only.

(g) The word "area" shall mean that part of the State of New South Wales lying within the boundaries of the ... Medical Association and defined by such association for the purposes of the formation of a "unit" within this area.

(h) The term "local emergency committee" shall mean the committee elected at a duly constituted meeting by the practitioners of the "unit".

III. GENERAL:

(a) *Basis of the Scheme.*—The basis of the scheme is that the practitioners of a "unit" shall enter into an agreement to protect the interests of those practitioners (absentee practitioners) who are engaged on whole-time war service in the following ways:

1. The "acting practitioners" will carry on the medical services, if possible without locums.

2. A "pool" shall be established, to which all takings, including the military pay of absentee practitioners, shall be credited.

3. Acting practitioners to refuse to attend, for at least twelve (12) months, patients of an absentee practitioner who has resumed practice after demobilization.

4. Appointments held by an acting practitioner on behalf of an absentee practitioner to be returned on the latter resuming practice.

5. Acting practitioners, for the duration of the war, to accept new appointments temporarily only, and in the case of public appointments, for example public hospital, to accept appointment for a period of no longer than one year.

6. Where an absentee practitioner sells his practice, the acting practitioner shall protect the buyer for a period of six months in the same way as the vendor.

7. In the case of death on active service of an absentee practitioner from a unit, the trustees shall, if requested, arrange for the sale of the practice, which shall be protected in the same manner as set out in the previous clause.

8. The acting practitioner shall display in a prominent position in his surgery (or consulting room) and waiting room a printed notice intimating that during the absence of a practitioner on active service his patients will be attended by a home practitioner in the neighbourhood, and on the return of the absentee practitioner they will be expected to seek any advice from him.

9. The acting practitioner should, for the information of the absentee practitioner, keep clinical records of any of the patients of the latter practitioner that he is required to attend.

(b) *Financial Arrangements.*—1. The pool referred to in Section III (a) 2 shall be controlled by trustees appointed for that purpose.

2. After all expenses are paid the remainder shall be divided according to the average annual return of each

practitioner, acting and absentee, over three years to June 30, 1939, as shown by the books of each practitioner, or such period as the local emergency committee shall determine.

3. The method of distribution of the pool shall be determined by the trustees.

4. Any moneys due to an absentee practitioner shall be paid to his legal representative.

(c) *General Administration.*—The administration of the scheme in a unit should be in the hands of a local emergency committee appointed at a meeting of all the practitioners in the area.

(d) *Disputes.*—Any question arising as to the interpretation of this scheme or as to any amount payable thereunder shall be referred to a committee appointed by the Council of the Association, whose decision shall be binding on all parties concerned.

(e) *Form of Agreement.*—The following form of agreement between the practitioner taking part in the scheme and the local emergency committee is suggested:

MEMORANDUM OF AGREEMENT made the ... day of ... 1939 BETWEEN ... of ... Registered Medical Practitioner AND ... of ... Registered Medical Practitioner AND ... of ... Registered Medical Practitioner (who and whose successors are hereinafter called the Committee) of the one part and the Registered Medical Practitioners whose names and addresses are subscribed hereto (hereinafter called the "Practitioners") of the other part—WHEREAS at a meeting of Registered Medical Practitioners residing and practising within the Shire, Municipality, Town of ... within the area of the ... Medical Association a Scheme for mutual protection and the preservation of the practices of any Registered Medical Practitioners within the said area who may be engaged in whole time war service was adopted AND WHEREAS the Committee have been appointed for the purpose of entering into the agreement hereinafter contained on behalf of all the Medical Practitioners who have subscribed their names hereto AND WHEREAS the Practitioners being desirous of obtaining the benefits of such Scheme for their mutual protection in the event of them or any of them being or becoming engaged in whole time war service have agreed to enter into the Agreement with the Committee hereinafter contained now in pursuance of the said Agreement and for the consideration aforesaid the Practitioners and each of them hereby respectively assent to the terms of the said Scheme (a copy of which is annexed hereto) and they and each of them undertakes and agrees with the Committee that he or she will in all respects conform to and comply with the terms and conditions of the said Scheme and that the Committee is hereby empowered to take such action as they or a majority of them in their absolute discretion shall deem necessary or desirable to enforce the same.

AS WITNESS the hands of the parties hereto:

WITNESS to the signature of

Explanatory Memorandum.

1. The Council has adopted, with some slight modifications, the model scheme of the Federal Council for the protection of the practices of members of the profession engaged in whole-time service.

2. Local associations and special groups of members are urged to take the necessary steps as soon as possible.

3. Establishment of a local emergency committee: An important part of the scheme is that a local emergency committee should be established forthwith. It is necessary then that local associations and special groups of members

should convene meetings of their members, and to which non-members should be invited, in order to arrange for the formation of "units". On the formation of a "unit" a local emergency committee should be appointed.

Notes on the Model Scheme for the Guidance of the Local Emergency Committee.

1. The intention is, firstly, to protect the capital value of the practice of an absentee practitioner and, secondly, to ensure that he receives a proportionate income from a pool of the takings and salaries of all practitioners concerned in the scheme.

2. The scheme will be effective only if the majority of the practitioners in the area agree to join in the communal arrangement. It is strongly desired that all practitioners should take part, for any other method of dealing with the situation will almost certainly lead to confusion, disappointment and financial loss—for instance:

(a) The nomination of one practitioner to conduct the practice of the absentee practitioner will not completely protect his interests. Some or many of his patients (according to whether he was in partnership or not) may not select the nominated practitioner as their doctor when they require treatment.

(b) To concentrate upon one individual the risk of maintaining the practice of any absentee doctor is undesirable. The illness, death or calling up on active service of the nominated practitioner may bring to an end the arrangements for the conduct of the practice of the absentee, and in the circumstances it may be difficult or impossible to take the steps necessary to prevent the serious depreciation of the capital value of both practices.

On the other hand, in the scheme there is a "spread" of the responsibility for the looking after the interests of the absentee. In short, it may be said that the scheme offers a practitioner the maximum amount of mutual insurance against damage to his practice, the minimum amount of financial loss and the minimum amount of anxiety about the way in which his interests will be conserved.

3. Presentation of the scheme to a general meeting. Arrangements should be made for a meeting of all members of a local association or special group, and to which non-members should be invited, to be convened for the purpose of considering the scheme. The model scheme, copies of which will be supplied by the Medical Secretary, should be issued to all concerned.

When "units" have been established the practitioners in each "unit" should convene a meeting for the purpose of adopting the following resolutions:

(a) That this meeting authorizes the establishment of a local emergency committee.

(b) That the said committee be a permanent committee and upon the death or resignation of a member it shall be competent for the said committee to fill the vacancies.

(c) That the said committee is hereby empowered to take such action as is necessary or which it may deem desirable to carry out the scheme effectively.

4. Appointments: The emergency committee should approach, either through the local association or the Council of the Branch, the board of a public hospital or any other body that may call for applications for the position of medical officer, and request that for the duration of the war the appointment should be made temporarily and for a period of not longer than one year.

5. Commencement of practice: The emergency committee should inform any medical practitioner who commences or proposes to commence practice without purchase in the area that he ought not to do so without the sanction of the Council of the Association, to whom his action will be reported.

6. Financial arrangements: It is necessary that all financial arrangements should be made in the strictest confidence.

Public Health.

EPIDEMIC ENCEPHALITIS.

IN 1927, through the generosity of Dr. William J. Matheson, the Matheson Commission for the Study of Epidemic Encephalitis was established in New York. In 1929 it issued its first report, followed in 1932 by a second and shorter one, which was reviewed in these columns. It has now published its third report, entitled "Epidemic Encephalitis: Etiology, Epidemiology, Treatment".¹

In the first chapter an outline is given of the work of the commission, which conducts two clinics a week, carries out important laboratory investigations, tries out various methods of treatment, and acts as a clearing-house for the vast literature on encephalitis. The second chapter consists of a summary of investigations that have been made since the second report appeared into the etiology of the various forms of encephalitis under the headings "Epidemic Encephalitis", "St. Louis Type Encephalitis", "Japanese B Encephalitis", "Human Encephalitis Caused by the Viruses of Eastern and Western Equine Encephalomyelitis", "Post-Vaccinal Encephalitis", "Post-Infectious Encephalitis", "Australian X-Disease and Hemorrhagic Encephalitis". This is followed by a similar review of louping-ill, lymphocytic choriomeningitis and the Guillain-Barré syndrome (infectious polyneuritis or "neuronitis"). Chapter IV gives a summary of the various methods of treatment, including reeducation, arranged alphabetically. Chapter V is a long one, of nearly a hundred pages, on the epidemiology of the various forms. The bibliography occupies 298 pages, and some idea of its extent may be gained from the fact that there are in it 319 authors whose names begin with B, and even 37 with Z.

Physicians dealing with these diseases, laboratory workers in the subject and epidemiologists owe a great debt of gratitude to the commission for a remarkably useful work. An up-to-date assessment of the various aspects of the subject is presented to the reader, who can rest assured that no important point has been omitted, whilst the bibliography can be consulted should further inquiries be necessary. We have much pleasure in directing the attention of those interested in encephalitis to a work which is indispensable to them.

Obituary.

SINCLAIR GILLIES.

WE are indebted to Dr. S. A. Smith for the following account of the career of the late Dr. Sinclair Gillies.

With the recent death of Sinclair Gillies at the age of seventy years there passed a figure who in his day, by force of intellectual gifts and striking personality and character, had a great influence on the study of medicine in this country. Sinclair Gillies was born in New Zealand and was the son of a distinguished jurist, Mr. Justice Gillies, the premier judge of the Supreme Court bench of New Zealand for many years. The name Sinclair was a reminder of the fact that he was the nephew of the last Colonial Secretary to administer the affairs of the Dominion. After leaving school the young Gillies became a student in arts at Auckland and ultimately obtained the Master of Arts degree. Thus early in his career his brilliant intellectual gifts came to be recognized, and after the completion of his university course in New Zealand he went to England with the intention of entering the University of Cambridge to study chemistry. After his arrival in England, however, other counsels prevailed and

¹ "Epidemic Encephalitis: Etiology, Epidemiology, Treatment", Third Report by the Matheson Commission, 1939. New York: Columbia University Press. Crown 8vo, pp. 492. Price: \$3.00.

he decided to study medicine and entered Saint Bartholomew's Hospital Medical School. His students and colleagues in Sydney could not fail to recognize the tremendous influence of this decision. His loyalty to "Barts" and his admiration of its traditions were obvious to everyone associated with him, and the manner in which these became the ultimate criterion of criticism in everything concerning the practice and administration of a medical school was the source of much affectionate amusement in his colleagues. His stay at Saint Bartholomew's was interrupted for a year, during which he went to Cambridge with his friend Kanthack. Here pathology and the diseases of children occupied him, but he returned to London and to the staff of Saint Bartholomew's under the great Samuel Gee—famous among other things as the author of Dr. Gee's aphorisms.

Gillies's student career in London was a very brilliant one. He took his doctorate in medicine, and several scholarships and medals came his way. That which he valued most was the Brackenbury Scholarship and Trevor Lawrence Gold Medal. A grief in later life was the purloining of this medal by a casual burglar, for it was prized because of its early associations and later, characteristically enough, because of the artistic beauty of the work of the sculptor Gilbert which it bore. Among his contemporaries were such men as Kanthack, Thomas Horder and Langdon Browne, and Gillies was not second to them. After nine years' residence in England he announced his decision to practise in Sydney. Influences of a powerful kind were brought to bear to induce him to stop in London, but he had made up his mind; and then, as later, a decision once taken was not to be altered lightly.

Gillies arrived in Sydney and immediately commenced practice. The brilliance of his early career in London was widely known and he was soon appointed to the honorary staff of the Royal Prince Alfred Hospital as assistant honorary physician. In 1911 he was appointed to the full staff and retired from active hospital work on account of age in 1929, becoming an honorary consultant physician. He was also senior honorary physician to the Lewisham Hospital for many years. Meanwhile he had achieved great success as a consulting physician.

As a teacher he had a most stimulating effect on his students, and as a physician he had a considerable influence on medical thought. The problems of the diet and nutrition of children were in his early days in the forefront of his mind, but somewhat later his special preoccupation was the study of pulmonary tuberculosis. It was due to his influence and enthusiasm that the antituberculosis clinic at the Royal Prince Alfred Hospital was established. He laid down its policy with a clearness of vision that has come to be recognized more and more with the passage

of the years. His enthusiasm, his devotion to his patients and their problems, his scepticism of dogma, his honesty and his argumentativeness stimulated all those junior colleagues on the honorary staff who were fortunate enough to work with him. There are many doctors and innumerable patients in this community who owe a profound debt to him for this work. This applies with peculiar force to tuberculous soldiers in the Great War. Gillies volunteered for service abroad, but at the special request of the medical authorities he remained in Australia to take charge of ex-soldiers invalided from the theatres of war because of tuberculosis. He was characteristically independent in the handling of this work, and it was a matter of regret to him always that his insistence on the personnel

of his staff was the cause of denying to some younger men the opportunity of serving overseas. It was only those closely associated with him who knew the amount and value of his work, both in repatriation and Red Cross problems, for returned men.

Another activity which owes much to him is the establishment of the Australian Trained Nurses' Association. As its first medical secretary and, shortly after, as its president, he was an important force in the organization of that body, which has done so much for the profession of nursing. Throughout his life there was nothing which moved him to anger more surely than the slightest disrespect or derogation of the physician's greatest helpers.

But in spite of his great interest in the problems of pulmonary tuberculosis, he was not a "specialist". His interests extended widely over the whole fields of internal medicine, which he taught with great enthusiasm for many years as a clinical teacher at the Royal Prince Alfred

Hospital. He brought to this work the fruits of his London training, the traditions of which he always sought to perpetuate. In a period when the teaching of medicine at the University of Sydney started to respond to new influences Gillies was one of a small band of brilliant clinicians whose influence on medical thought in this country was profound.

Gillies had a distinct personality and was as full of contradictions as many other brilliant men. Honesty of thought and devotion to the ideals of his profession inspired his every action. One smiled often at what one of his friends called his idolatrous worship of "Barts", but realized that the great ideals of that ancient fountain of medical knowledge and practice were things which he was determined to uphold. This determination was the source of much of that influence which he exerted on his colleagues and students.

He brought an intensely critical and analytical mind to bear on every question, and for this reason he was



frequently right in refusing to accept new claims to knowledge, adopted too soon by others more credulous and less critical than himself. At times, when he seemed overlong in his acceptance, those who did not know him well mistook consistency for obstinacy. His favourite sport was argument, conducted on his part with a provocative and sprightly sense of humour and with a determination to overwhelm his opponent. It was always stimulating to disagree with him, because he enjoyed the contest and even enjoyed being himself overwhelmed, and one always emerged from these discussions clearer and better informed. There were some who, on a first impression on these occasions, thought him intolerant, whereas he was above all things tolerant, except of the pretentious, the pompous and the insincere.

Gillies was a happy man in his work, his interests and his home. It is of this latter that his friends now think with sympathy and sorrow.

In the latter half of his life he got much pleasure not only from his enormous capacity for friendship but from the development of his innate appreciation of the arts. He acquired a love of music and his intuition for the best in painting, furniture and china was a source of infinite pleasure to him and his friends. He became a collector, and many enjoyed with him not only his collections but his amusing descriptions of his difficulties in preventing this passion from undermining his character.

No account of his life, however short, would be complete without a reference to the manner in which, in the last two years of his life, he bore the most distressing afflictions with a remarkable patience and fortitude. His clearness of vision, the philosophy he had always preached, and even his sense of humour stood to him to the end.

Dr. John H. Halliday writes:

It is no easy task to pay adequately any simple tribute to the memory of Dr. Sinclair Gillies. Endowed with a keenly critical mind, and favoured with a very liberal education, he became one of the greatest physicians of his generation and a most gifted teacher of clinical medicine. In both his hospital and private practice his work was distinguished by absolute sincerity and by standards which brooked no compromise. His case notes abounded in pithy marginal notes, which revealed his rare wisdom in the management of patients and which showed that he was of that fortunate few who had no difficulty in seeing the wood for the trees. He handed on to his students something of the essence of the tradition of his own Saint Bartholomew's Hospital, for which he always retained a very lively affection. Many of his students and house physicians will remember his constant allusions to the sayings of his own beloved teacher, Dr. Gee. In the closing years of his life, despite certain irksome physical disabilities, he retained all his whimsical yet pungent sense of humour and evinced the keenest interest in the profession at large and in the world of art, to which he was devoted. During his last illness he displayed a fortitude rarely witnessed, and in his passing our profession has lost one of its noblest elders.

WENDELL INGLIS CLARK.

We are indebted to Dr. W. E. L. H. Crowther for the following account of the career of the late Dr. Wendell Inglis Clark.

The news of the death of Wendell Inglis Clark will bring back innumerable memories to his friends. Perhaps the best known and certainly the most popular medical student of his period at Melbourne, he was in later life equally well known in the Australian Imperial Force. Born at Hobart in 1884, the son of the late Andrew Inglis Clark, a judge of the Supreme Court, he was one of a very united family of two daughters and five sons. From his maternal grandfather, John Ross, builder of the first patent slip at Hobart Town, and on which were constructed some of our finest sailing ships, must have come his marked

mechanical and engineering ability, which he loved to use as an escape from everyday problems.

In 1906, after graduating B.Sc. from the University of Tasmania, he commenced his medical course as a resident student at Ormond College. At the college initiation ceremonies Clark first showed his great aptitude in a comic acrobatic turn, and this with his whimsical personality won him great and enduring popularity. He was promptly coopted to play a part in the chorus of "The Wasps" of Aristophanes, and his delightful clowning with Franc Carse in that production, in the great hall at Ormond, was one of the unforgettable memories of the jubilee celebrations of the university. From this time he was *persona grata* with one and all of his year or any year or any school or any university; and to this day where the *Veteres* gather (the motto of Ormond is "*Et Nova et Vetera*") the talk flies back to this or that done by "Dummy" on such an occasion. Who can forget his experiments with an aeroplane model flown by two men of the college crew, who pedalled wildly one on each side of a telegraph pole, with the attached model between? Even Clark had to lie low till that blew over. Again, we remember the model in which he tried to fly from the tall fence of the tennis courts. These experiments took so much of his time and thought as to bring to his friends the gravest anxiety when the end of the year and examinations approached. Somehow he just managed to get there each time, and graduated in 1911.

Work followed on King Island and later at Mount Balfour, a big silver-lead mine south of the Arthur River, in the remotest part of the State.

His war service with the 40th Battalion was an epic of comradeship and courage. His was the ideal nature for a regimental medical officer, and he set the highest standard. He loved to be part of this essentially Tasmanian unit, but even here his inveterate love of practical joking came out. On Salisbury Plains, having dined and wine, returning home he deliberately turned out the main guard and inspected them. This was too much, and an inquiry followed; and he once told me that for the rest of his service he never felt he could put matters right between himself and at least one senior combatant officer. A Military Cross and promotion came, and the latter meant posting to one of the divisional ambulances, with which he finished out the war. Until recent years he served his old regiment as regimental medical officer, and the annual camps were much looked for reunions.

What shall I say of his work as a general practitioner in post-war years at Hobart? A splendid obstetrician, infinitely patient and most adequate when difficulties arose. In all other branches of his work thorough and painstaking, with only one thought and guiding interest, his patient's welfare. He had, however, one little weakness—for a busy man time meant just nothing to him. Only he knew how to disarm a theatre team who had been waiting for him as anaesthetist for anything up to half or three-quarters of an hour. His shy smile and a word sufficed.

With his failing health and consequent inability to work to a settled date or time, he gradually ceased his association with the British Medical Association and its activities. This did not, however, in the least affect his attitude towards the Association and its members, and it was always felt that if called on his support was available.

For himself, physically and financially, no thought. He has often given the best part of a working day to some poor soul, the remainder of a long visiting list being quite forgotten.

Very early after the war came a duodenal ulcer, with constant pain and eventual perforation. Somehow for years, in spite of this, he carried his burden without complaint and with the most consideration for those who were the least thoughtful for his little strength. The last four years of his life were a haven in which he was able to relax at last, follow his hobbies and do those things he wished. The memory of such a life, when the poorest and most needy were considered first, is an inspiration and example to his profession and the community in which he worked. To Mrs. Clark, his wife and constant companion, has gone the universal sympathy of those who lived and worked so happily with him. *Homo erat et adus amicus.*

This appreciation is from one who shared with him for five years a study at Ormond, the war years with the Australian Imperial Force, and since the happy routine of general practice in Hobart.

FREDERICK JOHN GAWNE.

We regret to announce the death of Dr. Frederick John Gawn, which occurred on September 17, 1939, at Jeparit, Victoria.

LOUIS BERNARD DIAMOND.

We regret to announce the death of Dr. Louis Bernard Diamond, which occurred on October 14, 1939, at East St. Kilda, Victoria.

Medical Practice.

THE MEDICAL EYE SERVICE OF NEW SOUTH WALES.

The Secretary of the Ophthalmic Association Limited, of New South Wales, writes that the association held its fifth annual general meeting of members on August 23, 1939.

The clinical activities of the association are carried on under the name of the Medical Eye Service of New South Wales, which was established by the Ophthalmological Society of New South Wales in September, 1934, to provide examination and treatment by ophthalmic surgeons to persons who decline to go to public hospitals and who are unable to afford private fees.

The clinic has had a successful year, and steps are being taken to acquire permanent premises. There are thirty-one members of the association. Clinics are held every afternoon and evening and on Saturday morning. A subsidiary activity of the association is the conduct of an orthoptic clinic.

The Medical Eye Service of New South Wales has the support of a great number of medical practitioners and should be utilized more freely. It performs a function which is a valuable contribution to the health services of the State.

Post-Graduate Work.

WEEK-END COURSE AT BRISBANE.

The Queensland Post-Graduate Committee announces that a week-end course will be held at Brisbane on Saturday and Sunday, November 4 and 5, 1939. The programme is as follows:

Saturday, November 4.

Mater Misericordiae Public Hospital.

9.30 a.m.—"Gas Casualties", Dr. C. C. Minty.

11 a.m.—Demonstration of fractures, Dr. A. V. Meehan and Dr. John R. S. Lahn.

Medical School, Students' Lecture Theatre.

2.30 p.m.—"Recent Injuries of the Back", Dr. G. A. C. Douglas.

3 p.m.—"Migraine", Dr. Clive Sippe.

4 p.m.—"Undescended Testicle", Dr. K. B. Fraser.

4.30 p.m.—"Common Diseases of the Rectum", Dr. G. H. Brandis.

8.15 p.m.—"The Treatment of Osteomyelitis", Sir Robert Wade.

Sunday, November 5.

Medical School, Students' Lecture Theatre.

10 a.m.—Clinical meeting combined with the Brisbane Hospital Clinical Society.

The subscription for the course is half a guinea, and members who intend to join are requested to notify the Honorary Secretary, Post-Graduate Committee, British Medical Association House, 225, Wickham Terrace, Brisbane, as soon as possible, and enclose cheque for the above amount.

Correspondence.

M.D. DEGREES IN AUSTRALIA.

SIR: My attention has been directed to a letter in your issue of September 23 concerning M.D. degrees in Australia.

While libel sheltering characteristically under alien anonymity may be ignored, it is desirable that grossly misleading statements concerning degrees of an Australian university should not appear to receive sanction from THE MEDICAL JOURNAL OF AUSTRALIA. The M.D. degree of the University of Melbourne, like that of the University of Adelaide, may be obtained by examination, by examination and thesis or by thesis, that of the University of Sydney by examination and thesis or by thesis. The examination in Melbourne is in two parts, and admission to Part I of the examination is permitted to Bachelors of Medicine and Bachelors of Surgery of at least one year's standing. In the case of all three universities at least two years must elapse after graduation as bachelor before graduation as doctor is possible. The award of the degree of M.D. is a warrant of attainment within a necessarily wide range of acceptable medical experience. Since medical appointments have a similarly wide range, the responsibility for judgement of the pertinence of medical degrees rests on the selectors.

The standard required for a thesis in Melbourne defies challenge, and the rigor of the M.D. examination is such that the Faculty of Medicine has at present under consideration plans to mitigate its demands without jeopardizing its soundly established prestige.

The regulations on pages 424 and 425 and the details of subjects on pages 452 and 453 of the Melbourne University Calendar indicate clearly the wide scope of the tests imposed on candidates in both parts of the examination for this degree.

Yours, etc.,

P. MACCALLUM,

Professor of Pathology, Dean of the Faculty of Medicine.

The University of Melbourne,
Melbourne,
October 16, 1939.

TREATMENT OF WOUNDS OF THE HAND.

SIR: Dr. Lennox Teece's paper on the treatment of wounds of the hand draws attention again to the poor results of either primary or secondary suture of the flexor tendons in the flexor sheaths of the fingers; also of the *flexor pollicis longus*. He has adopted and now placed his imprimatur on the continuance of a hopeless and fatalistic attitude towards this gratifying branch of finger surgery, where I know successes can be obtained despite the hundreds of failures he has seen. I should like to express my appreciation of and concurrence with the views expressed by Dr. D. Glissan at the discussion on Dr. Teece's paper and by you in your editorial. If Bunnell, Iselin and others claim good results for the flexor tendon repairs in the fingers, then we may say they are untruthful or else try to follow in their footsteps. I have tried the latter course and have also obtained some successes and of course failures, but not many of those

lately, and I now attack this problem with the confidence justified by past successes. When I made this statement at a medical meeting here two years ago I was surprised when two experienced surgeons sincerely told the meeting as politely as they could that they did not believe that anyone could show one good result in Melbourne. Thereupon within a month I showed two patients who had been operated upon for division of three and four finger tendons respectively in each hand within the flexor sheaths of the fingers with splendid function, at a clinical meeting at which they attended. These clinical cases were printed in the programme, but I do not remember that they came and saw the patients, although they attended the meeting. Since then I have repaired more tendons in the flexor sheaths of the fingers and I set out to cure these patients with a good deal of confidence.

I realize that in view of the devastating and general unanimity of surgical opinion which holds, according to Dr. Teece, that repair of the flexor tendons in the flexor sheaths of the finger is always a hopeless task, that I must bring forward proof that the position is far from hopeless. This I hope to do in a later paper. My opinion will then be backed not by one lucky chance success, but by a number, although naturally there will be some disappointments to record. I shall also, in such a paper, be able to describe the treatment adopted. I should like to have been able to set out details of the treatment in this letter, but to do so would occupy too much space. It is these details that make for the successful repair.

Yours, etc.,

THOMAS KING.

2, Collins Street,
Melbourne,
October, 1939.

ELECTION OF STANDING COMMITTEE OF CONVOCATION, UNIVERSITY OF SYDNEY.

SIR: As a representative of the Medical Faculty on the provisional committee of the Graduates Association, I wish to draw the attention of all Sydney graduates to the above, which is to be held in conjunction with the Senate election on November 10, 1939.

It is necessary for those who intend to vote to apply to the Registrar for a ballot paper, as is done in the Senate election, unless the graduate is able to attend and vote in person.

Yours, etc.,

A. M. DAVIDSON.

Al-Kasr,
Edgeware Road,
Enmore,
New South Wales.
October 17, 1939.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

At a recent meeting of the Senate of the University of Sydney the following appointments were made: Miss M. T. Ravenscroft as a tutorial class lecturer in Anthropology and Mrs. Caroline Kelly to complete a course of lectures in Anthropology in Newcastle; Professor J. L. Shellshear, formerly professor of anatomy in the University of Hong-Kong, as a full-time officer in the department of anatomy from January 1, 1940; Mr. R. C. Betty, B.Sc., as biochemist in the department of medicine; Dr. R. M. Kirkpatrick and Mr. S. Levine as part-time demonstrators in prosthetic dentistry; Dr. R. M. C. Gunn as acting professor of veterinary science.

Dr. R. G. Waddy.—Dr. R. G. Waddy, lecturer in ophthalmology, has been compelled to resign his position on account of ill health. The Senate has placed on record an expression of appreciation of his services and has accepted his resignation with regret.

Benefaction.—Mr. and Mrs. W. E. G. Partridge, of Sutherland, have established a memorial scholarship in the Faculty of Dentistry in memory of their late son, Walter John Douglas Partridge, who was killed by lightning last year. Mr. and Mrs. Partridge have forwarded the sum of £500 for the purpose of establishing a scholarship tenable by a second-year student for proficiency in certain subjects of the dental curriculum. The Faculty of Dentistry has been asked by the Senate to draw up suitable conditions for the award of the scholarship, and an expression of grateful thanks has been tendered to the donors for their valuable benefaction.

University Senate Election.—Nominations are now being received by the Registrar for the quinquennial election of Fellows by the graduates on November 10. Nominations close on Friday, October 13.

Election of First Standing Committee.—The first election of the Standing Committee of Convocation will be held on Friday, November 10. Nominations will close on Wednesday, October 11. Nominations must be lodged with the returning officer, Mr. P. C. Greenland, Secretary of the University Appointments Board, 76, Elizabeth Street, Sydney. Voting will be by post.

Naval, Military and Air Force.

MEDICAL OFFICERS FOR THE AUSTRALIAN SPECIAL FORCE.

THE Director-General of Medical Services announces that vacancies still exist on the medical staffs of the casualty clearing stations and the two general hospitals which are to form part of the special Australian force. Vacancies are chiefly those in junior positions, corresponding to resident medical officer posts in civil general hospitals, but there are also some vacancies in senior and specialist positions. Medical men desiring appointment to the force should make application to the D.D.M.S. in each military district.

The Royal Australasian College of Surgeons.

MEETING OF THE BOARD OF CENSORS.

THE next meeting of the Australian Board of Censors of the Royal Australasian College of Surgeons will be held at the College, Spring Street, Melbourne, probably in March, 1940. Candidates who desire to present themselves at this meeting should apply to the Censor-in-Chief for permission to do so, on or before December 30, 1939. The appropriate forms are available at the College, Spring Street, Melbourne, and at the offices of the various State Secretaries.

Proceedings of the Australian Medical Boards.

SOUTH AUSTRALIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Practitioners Act, 1919* to 1935, of South Australia, as duly qualified medical practitioners:

Walker, Morris Arthur, L.R.C.P. & S. (Edinburgh),
L.R.F.P.S. (Glasgow), 1932, Karoonda.
Moody, Charles Alfred, M.R.C.S. (England), L.R.C.P.
(London), 1925, Torrensville.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Khan, Albert Edward, M.B., B.S., 1936 (Univ. Sydney), 156, Chalmers Street, Sydney.

Stening, Warwick Sydney Lees, M.B., B.S., 1938 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Books Received.

PUBLICATIONS OF THE SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH, edited by the Director: Number XLII: The Laval Trematoda Found in Certain South African Mollusca, with Special Reference to Schistosomiasis (Bilharziasis), by A. Porter, D.Sc., F.R.S.S., F.L.S.; 1938. Johannesburg: The South African Institute for Medical Research. Imperial 8vo, pp. 492, with 83 plates, 1 map and 1 text figure.

PUBLICATIONS OF THE SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH, edited by the Director: Number XLIV: Blood Groups in Africa, by R. Elsdon-Dew, M.D.; 1939. Johannesburg: The South African Institute for Medical Research. Imperial 8vo, pp. 94, with illustrations.

OFFICE GYNECOLOGY, by J. P. Greenhill, B.S., M.D., F.A.C.S.; 1939. Chicago: The Year Book Publishers. Demy 8vo, pp. 406, with illustrations.

CLIO MEDICA: OPHTHALMOLOGY, by B. Chance, M.D.; 1939. New York: P. H. Hoeber Incorporated. Foolscap 8vo, pp. 257, with illustrations. Price: \$2.00 net.

Diary for the Month.

- Nov. 1.—Western Australian Branch, B.M.A.: Council.
- Nov. 1.—Victorian Branch, B.M.A.: Branch.
- Nov. 2.—South Australian Branch, B.M.A.: Council.
- Nov. 2.—Queensland Branch, B.M.A.: Branch.
- Nov. 7.—New South Wales Branch, B.M.A.: Organisation and Science Committee.
- Nov. 10.—Queensland Branch, B.M.A.: Council.
- Nov. 14.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
- Nov. 14.—Tasmanian Branch, B.M.A.: Branch.
- Nov. 15.—Western Australian Branch, B.M.A.: Branch.
- Nov. 21.—New South Wales Branch, B.M.A.: Ethics Committee.
- Nov. 22.—Victorian Branch, B.M.A.: Council.
- Nov. 23.—New South Wales Branch, B.M.A.: Clinical Meeting.
- Nov. 24.—Queensland Branch, B.M.A.: Council.
- Nov. 24.—Tasmanian Branch, B.M.A.: Council.
- Nov. 28.—New South Wales Branch, B.M.A.: Medical Politics Committee.
- Nov. 30.—South Australian Branch, B.M.A.: Branch.
- Nov. 30.—New South Wales Branch, B.M.A.: Branch.

Medical Appointments.

Dr. A. T. Denneen has been appointed Government Medical Officer at Picton, New South Wales.

Dr. J. A. R. Murphy has been appointed Medical Superintendent of the Waterfall Sanatorium, Office of the Director-General of Health of New South Wales.

Dr. A. J. Gumley has been appointed a Quarantine Officer, pursuant to the provisions of the *Quarantine Act*, 1908-1924.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xviii-xx.

QUEEN'S MEMORIAL INFECTIOUS DISEASES HOSPITAL, FAIRFIELD, VICTORIA: Consultant Surgeon.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCHES.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17.	Brisbane Associate Friendly Societies' Medical Institute. Proserpine District Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 178, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	Wiluna Hospital. All Contract Practice Appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognise any claim arising out of non-receipt of journals unless such a notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad per annum payable in advance.